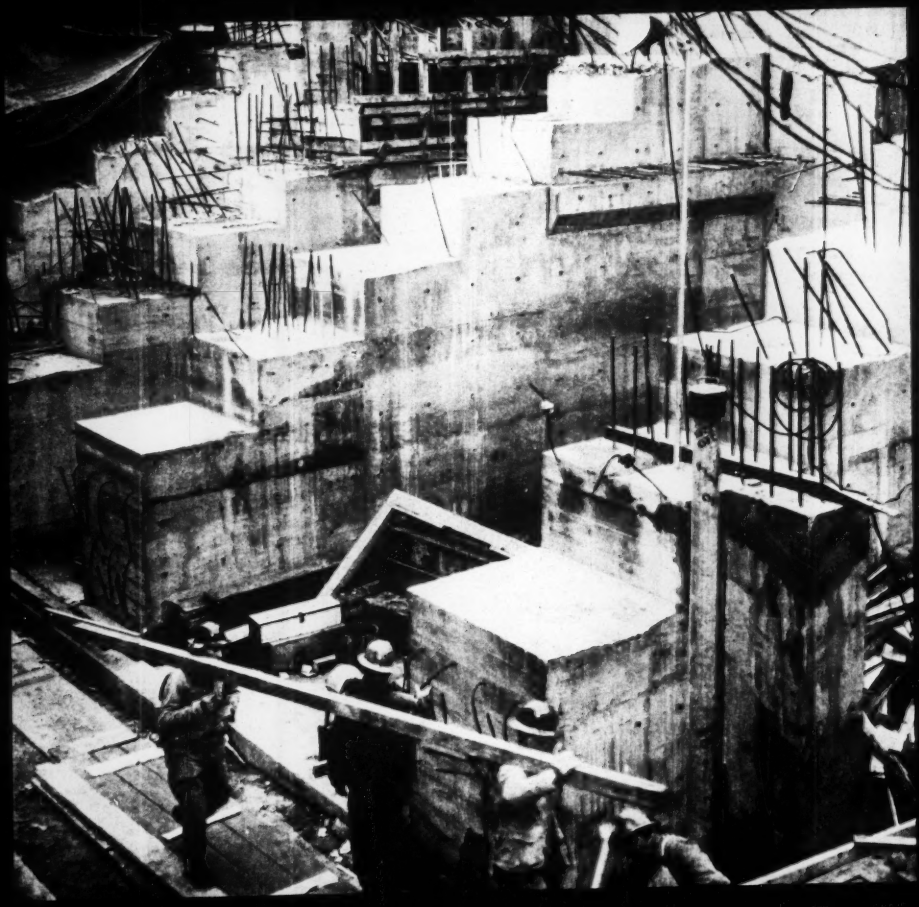
ENGINEERING NEWS-RECORD



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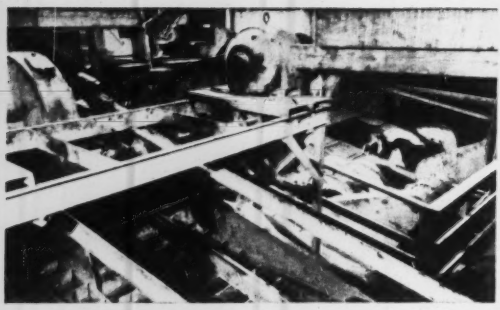
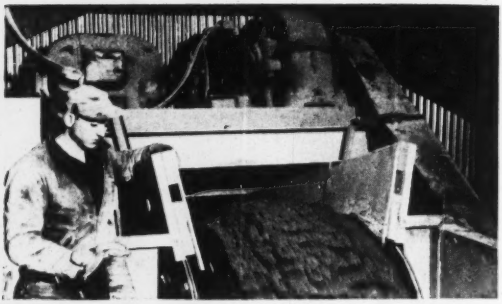
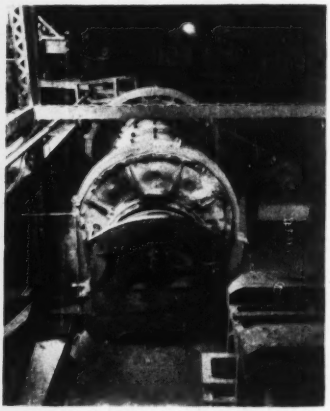


Aggregate under 6 inches is separated in shakers at screening plant. A G-E 5-hp motor drives shakers. Plant is completely automatic.



Carrying cement mix along this indoor conveyor system is a crucial step in construction of the dam. Sturdy G-E 100-hp motor drives the belt.

Aggregate for batching plant at Hungry Horse Dam is carried 1600 feet up the canyon wall by conveyor, driven by reliable G-E 100-hp motors in wooden sheds at intervals of 250 to 300 feet.



This Marcy rod mill, used in the gravel-crushing operation at the screening plant, is driven by a G-E 200-hp motor (right center). The motor is protected against heavy dust.

push-button aggregate processing at 700 tons/hr.

. . . Electrically

General-Shea-Morrison, contractors for the Bureau of Reclamation's Hungry Horse Dam, are going all-out with electric equipment. Best example is their aggregate plant with its network of interconnecting conveyors geared to process 700 tons of raw aggregate every hour. It's one of the most modern installations of its kind in the country—strictly a push-button operation from raw aggregate handling to mixing. Only with modern electric drives can this world's fourth largest dam be completed on schedule in 1952.

As time goes on, contractors are discovering more and more that it pays to electrify. With co-ordinated use of G-E motors and control and G-E power-distribution systems, they're getting safer, more flexible, and more efficient operation. *Apparatus Department, General Electric Company, Schenectady 5, N.Y.*

Ask him Today!

Whether you buy or build construction equipment, your G-E representative can show you how to do a better job—at lower cost—by complete electrification. Write him now, and he'll call on you at your convenience.

ELECTRIFIED EQUIPMENT Speeds Construction— Cuts Costs

GENERAL ELECTRIC

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... that they can be threaded to any standard or special requirement?

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... that Bethlehem Tie-Rods come straight or bent, in single or multiple units, asphaltum-dipped or hot-dip galvanized?

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ENGINEERING NEWS-RECORD

ABP Member ABC

Volume 146 APRIL 19, 1951 No. 16

WALDO G. BOWMAN
Editor

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Number of copies of this issue printed 46,620

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Domestic News Bureaus—Atlanta, Chicago, Cleveland, Detroit, Houston, Los Angeles, San Francisco, Washington. Correspondents in 71 cities in the United States, Canada and Mexico.
Foreign News Bureaus—London, Frankfurt, Paris, Moscow, Tokyo, Bombay, Melbourne, Rio de Janeiro, Mexico City, *Correspondents*—Athens, Rome, Caracas, Buenos Aires, Santiago, Shanghai, Zurich, Johannesburg and 40 other cities.

ROBERT F. BOGER
Publisher

April 19, 1951 ENGINEERING NEWS-RECORD Vol. 146—No. 16
Member ABC and ABP

Published weekly by McGraw-Hill Publishing Company, Inc., James H. McGraw (1860-1948), Founder. **Publication Office, 99-129 North Broadway, Albany 1, N. Y.**

Executive, Editorial and Advertising Offices: McGraw-Hill Building, 330 W. 42nd St., New York 18, N. Y. Curtis W. McGraw, President; Willard Chevalier, Executive Vice-President; Joseph A. Gerardi, Vice-President and Treasurer; John J. Cooke, Secretary; Paul Montgomery, Senior Vice-President, Publications Division; Ralph B. Smith, Editorial Director; Nelson Bond, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Vice-President and Director of Circulation.

Subscriptions: Address correspondence to Engineering News-Record—Subscription Service, 99-129 N. Broadway, Albany 1, N. Y., or 330 W. 42nd St., New York 18, N. Y. Allow ten days for change of address.

Please indicate position and company connection on all subscription orders.

Single copies 35¢. Subscription rates—United States and possessions, $6.00 a year; $9.00 for two years; $12.00 for three years. Canada, $8.00 a year; $12.00 for two years; $16.00 for three years. Pan American countries, $10.00 a year; $16.00 for two years; $20.00 for three years. All other countries, $20.00 a year; $30.00 for two years; $40.00 for three years. Entered as second class matter October 29, 1936, at the Post Office at Albany, N. Y., under Act of Mar. 3, 1879. Printed in U. S. A. Copyright 1951 by McGraw-Hill Publishing Co., Inc.—All Rights Reserved.

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On the hundreds of jobs where *ESCO* buckets are working long after other makes have worn out, the story of *ESCO* stamina is being written every day. But the real inside story is the metallurgy, engineering and craftsmanship that make this endurance possible. Shown here are a few details typical of the rugged construction that means greater production on your jobs

HOLLOW ARCH CONSTRUCTION eliminates excess weight and increases strength. Used on all *ESCO* buckets over ¾ yard. Cast T section arch used on smaller sizes.

6-YARD *ESCO* HEAVY DUTY (STANDARD) DRAGLINE BUCKET. Other dragline sizes and types, plus full line of dippers, provides a bucket for every digging job.

LONG BOWL ROPE SOCKET. Light weight; strong—develops more than 90% of rated cable strength; equal wedging action on all six strands; eliminates crushing and distortion of wire rope.

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TRUNNION BRACKETS, links and pins of manganese steel. Alternate holes for adjusting of digging and carrying positions.

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Send in coupon for literature. Catalogs of *ESCO* dragline and dipper buckets which give detailed information about sizes, weights, dimensions, etc., are yours for the asking. Ask your nearest *ESCO* representative for catalog 188 for dragline buckets; catalog 189 for dippers. Or use the coupon.

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Please send catalog ☐ 188 *ESCO* dragline buckets. ☐ 189 *ESCO* dipper buckets.

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Here is another good example—one of many—to prove that it pays to work with Clark: A transmission-axle unit designed especially for a road grader by the manufacturers' engineers and Clark engineers working together.

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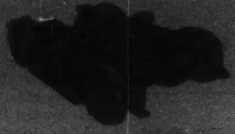
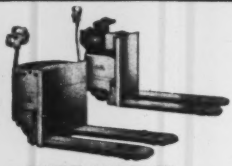
ELECTRIC STEEL CASTINGS

GEARS AND FORGINGS



STREET RAILWAY CAR TRUCKS

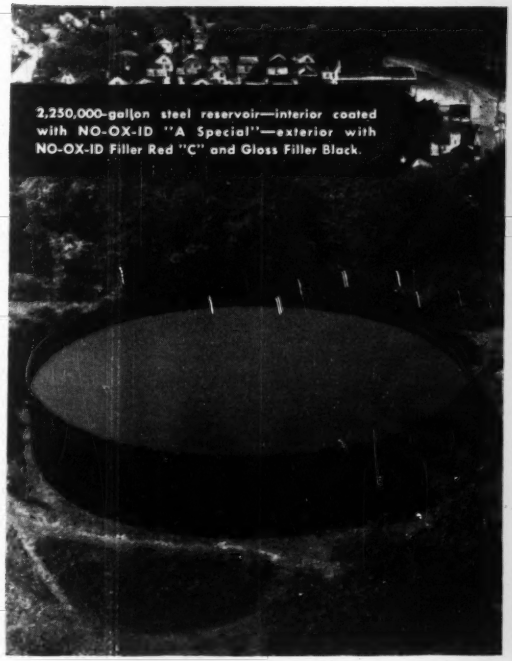
AXLE HOUSINGS



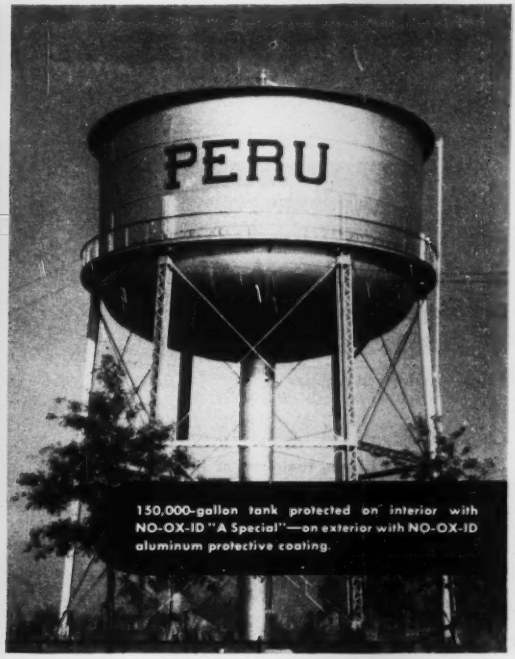
POWERED HAND TRUCKS

FRONT AXLES

REAR AXLES (SPECIAL)



2,250,000-gallon steel reservoir—interior coated with NO-OX-ID "A Special"—exterior with NO-OX-ID Filler Red "C" and Gloss Filler Black.



150,000-gallon tank protected on interior with NO-OX-ID "A Special"—on exterior with NO-OX-ID aluminum protective coating.

On water tanks . . . NO-OX-ID *will*

stop rust before it starts!

The water tanks and reservoirs that you erect and maintain can be positively protected from rust with Dearborn NO-OX-ID Rust Preventives. And, there's nothing complicated about it—a single coat, applied to both the interior and exterior, stops rust immediately—right then and there!

Water tanks and reservoirs are only two of the many structures that NO-OX-ID protects. Whether you build bridges or viaducts, factories or pipe lines . . . any structures where there is metal-to-metal, metal-to-concrete or metal-to-wood contact, you will *stop rust before, or after, it starts* with NO-OX-ID Rust Preventives.

A Dearborn representative will gladly discuss the important matter of rust prevention with you or your engineers.

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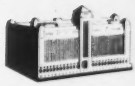

On and after April 16, the new and enlarged general offices of Dearborn Chemical Company will be located in The Merchandise Mart.

WRITE FOR BOOKLET containing information on how to protect water tanks for as long as 20 years without loss of metal. Illustrated booklet, "NO-OX-ID Versus Water," will be sent on request.

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IRON + OX = RUST

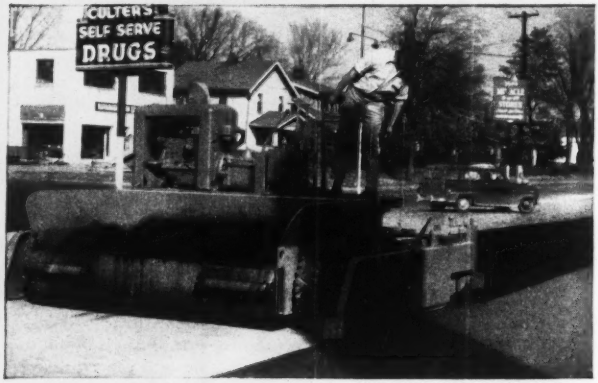
These labor-saving JAEGER tools do

Up to 12" thickness in widths to 11', lesser thicknesses to 12'6"

Lay bigger tonnage, accurately, with low cost Paver-Type Aggregate Spreader

Costs half the price of bituminous pavers. Efficiently lays bigger tonnages of base and surface aggregates, free-flowing hot or cold bituminous mixtures or plant-mixed stabilized soil. Crawler or 4-wheel drive operates on subgrade, not on newly-laid material. Straightedge runners insure accuracy of strike-off for highway, street and airport base and both base and top of secondary roads, parking areas and drives. Two models, to work with any size trucks. Ask for Catalog SPS-1.

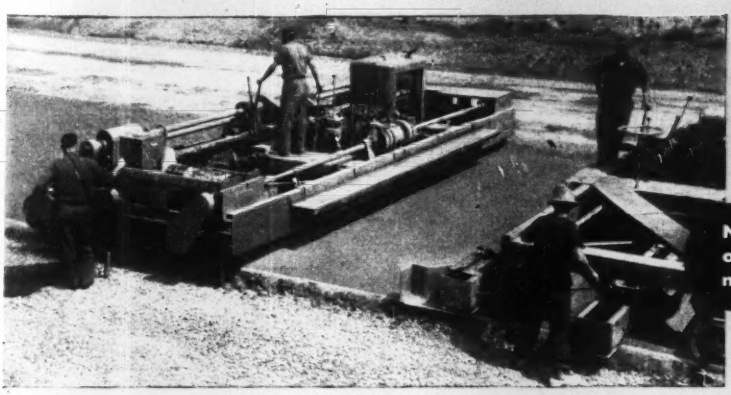
Big savings to small contractors paving parking lots and drives.



For precision paving with all types of bituminous material, Jaeger improved Model BP-5

The only bituminous paver that (1) operates entirely on the subgrade or compacted course (2) continuously "averages out" subgrade irregularities by means of straightedge runners, (3) automatically matches adjacent course, curb or other grade line, (4) works mat to any uniform desired density with fast-oscillating tiltable screeds, (5) adjusts for 9' to 12½' widths with the twirl of a wheel, (6) can lay flush to curbs or headers. Ask for Catalog BP-0.

what machines could never do before



Note how oscillating screed on spreader accurately meters material to finisher

Jaeger 3-Screed Paving Team gives steady high production of better finished slab

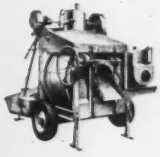
Latest Screw-and-Screed Spreader remixes, compacts, and strikes-off material as fast as dual drum pavers can produce it, *then, with its oscillating 12" screed, accurately meters the exact amount of material required* for the finishing machine. No excess or deficiencies, no costly carry-back, always uniform compression under the finisher screeds.

Type "X" Finisher, with its transverse front screed and diagonal rear screed, gives a precision finish, *can carry material uphill and place it solidly against higher form on pitched slab and superelevated curves,* eliminates much costly hand work and finishes harsh material faster without tearing.

This 3-screed "team," exclusive with Jaeger, has saved the cost of a second finishing machine on high production work in various States. Screw-and-Screed Spreader is also adaptable for bituminous pavements. Ask for Catalogs FX-8 and CSS-0.

"New Standard" AIR-PLUS Compressors deliver 15% to 25% more air, to do 30% to 40% more work

Two heavy duty breakers, powered by a Jaeger Model 125 compressor, will break pavement up to 40% faster than the same tools run by any 105 ft. compressor. From the Model 75, for one breaker, up to the Model 600, for two heavy duty wagon drills plus an auxiliary drill, Jaeger "new standard" sizes provide the additional air you need to run a full set of tools at top pressure instead of weak 70 lbs.—delivered at the lowest cost per cubic foot of air of any compressors on the market. Ask for Catalog JC-1.



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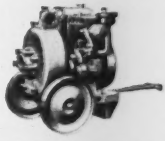
More batches per hour with fast "Skip Shaker" loader and thorough mixing, fastest discharging "Dual Mix" drum. Machined steel drum tracks, automotive-type transmission. Sizes 3½S to 16S portables.



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Built oversize for lower speed, longer life operation. Two independent, simultaneous priming actions—doubly sure. Positively lubricated seals—exclusive with Jaeger. De-watering pumps to 240,000 gph; pressure pumps for up to 275 psi; well point systems.

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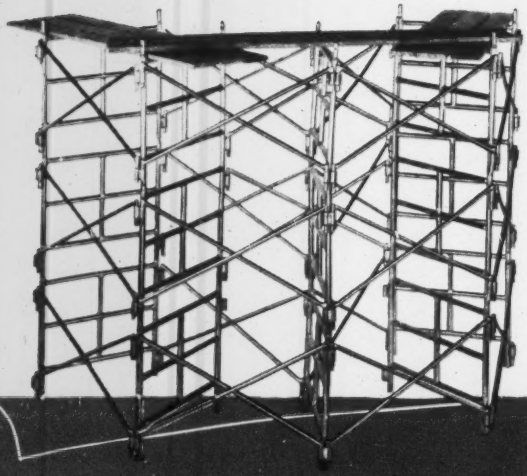
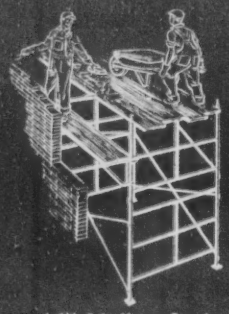


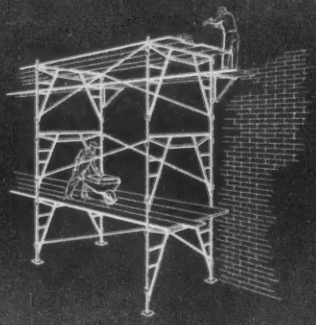
with UNIVERSAL Ezebilt

Below are applications showing Ezebilt's versatility in three mason jobs. Note how side brackets provide areas for exclusive use by mason—material storage always at convenient height—wheelbarrow passages easily available.

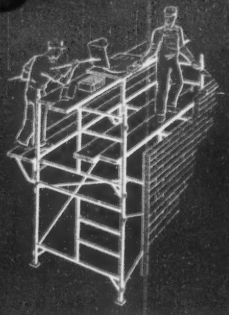
No Bolts!
No Nuts!
No Loose Parts!



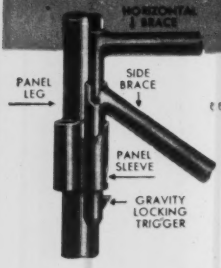
4-4½-5 ft. Mason Panels with intermediate plank-bearing areas.



6½ ft. Mason Panels with through passageway at every lift.



4-4½-5 ft. Mason Panels with open sides for intermediate runways.



It's the "Gravity Lock"!

- Completely automatic, requires only one man to assemble units.
- Permits single bracing, fewer parts required.
- Swivel Action permits 'racking down' and circular scaffolding.

FOR *ANY* SCAFFOLDING JOB—demand the one best scaffold that is unrivaled for ease of assembly and for economy in operation. Whether it's a small masonry or carpentry job, an inside painting or maintenance job, or a tall building construction, Ezebilt's exclusive Gravity Lock feature helps you erect faster—no bolts or tools, no loose parts—just put the units into position and the scaffolding is assembled.

Send for Complete Descriptive Catalog

UNIVERSAL MANUFACTURING CORPORATION

World's Largest Producer of Steel-Panel Scaffolding

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For Tubular Towers Catalog—Write our AMERICAN TUBULAR ELEVATOR CO. DIVISION

What's behind the Euclid name?

Building a road in the mountains of Colorado—this "Euc" is dumping 15 tons of fill material.

Working on a levee in Arkansas—Bottom-Dump Euclids are the outstanding choice of levee contractors.

Getting a 22-ton load of rock at Downsville Dam in New York—"Eucs" are built for heavy off-the-highway work.

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The Euclid reputation for long, dependable service life and efficient performance is backed by strategically located distributors and factory branches. Adequate stocks of genuine Euclid parts and the facilities of this world-wide organization assure prompt service to Euclid owners everywhere.

The fact that 80 per cent of all Euclids built are still in use today is proof of their rugged construction and staying power on the toughest jobs. Readily available parts and service result in less down time and customer satisfaction.

Have your Euclid Distributor show you how "Eucs" can lower your off-the-highway hauling costs. Ask about the models best suited for your own job requirements.

The EUCLID ROAD MACHINERY CO.,
CLEVELAND 17, OHIO
CABLE ADDRESS: EUCLID CODE: BENTLEY

MORE LOADS PER HOUR—
MORE PROFIT PER LOAD

EUCLIDS *Move the Earth*

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Now you can locate bedrock and plot its contour in minutes instead of hours. To learn more about this new and PROVEN method of bedrock finding without detailed and costly drilling, write *1337 North Utica*

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EXPORT: 149 Broadway, New York

NEWS BRIEFS

Colored route markers—No longer will out-of-state motorists have to pull out their road maps and figure how they are going to find their way through the traffic-jammed "cow lane" streets of Boston, Mass. New route markers, different colors for different routes, are a State Department of Public Works experiment.

Edgar F. Copell, who is engineer in charge of traffic for the department, says that if the experimental contrasting colored markers prove of value they will be put up at other points of congestion. "Quick recognition of the colors signifying different routes ought to be a timer saver for drivers" Mr. Copell said.

Public construction coordinated—All public construction by municipal and quasi-municipal bodies in Philadelphia, Pa., has been coordinated. This includes the Board of Public Education, the Housing Authority, and the Redevelopment Authority. All projects are to be cleared through the City Planning Commission which will recommend a public improvement program for 1952-57.

Expensive snow—Through Feb. 4, the snow removal bill of Detroit, Mich., totaled $598,800. The city council put in a request for $350,000 more for the rest of the winter. Public Works Department used up 27,187 tons of salt to keep the streets clear. Total snowfall was under 49 in. but much higher than the 19 in. recorded in the city for the corresponding period a year ago.

Big blow torch—Heavy rains delayed the N. Fiorito Co. of Seattle, Wash., on its contract for extension of McChord Field runways for the Corps of Engineers. Everything was so wet that it was impossible to burn huge piles of slashings and stumps. But Dan Fiorito, partner in the company, solved the problem by installing a 50-gal. oil drum, an airplane propeller, a pump and a hose on a tractor. He backs the tractor up to the pile that requires burning, sprays it with oil and, after lighting, starts the propeller. This generates a 35-mph wind which makes the fire roar despite the wetness of the wood.

Radio-television center—At Philadelphia, Pa., foundations have been completed for the 100,000-sq ft radio and television center which the Austin Co is erecting on a 10-acre site for Station WCAU. There will be nine studios on the main floor, with a clear height

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With a BAY CITY built CraneMobile you get a 2-in-1 combination that's hard to beat. The ruggedly constructed carrier is designed and engineered to meet difficult operation conditions and has the power, speed, and mobility to get to the job fast. The powerful crane is designed for high performance and easy operation. Put them together and you have the perfect solution for handling heavy loads, high lifts, and long reaches. S. J. Groves and Sons, repeat BAY CITY buyers, have found that to be true with their 25-ton CraneMobile shown here working on the New Jersey Turnpike project near Swedesboro, N. J. Like Groves, owners everywhere have found that a CraneMobile means a profitable operation . . . why not see your nearest dealer or write us for the full story on the BAY CITY CraneMobile. BAY CITY SHOVELS, INC., BAY CITY, MICHIGAN.

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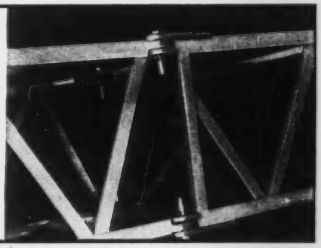
BAY CITY booms are of all-welded high strength alloy steel construction, pin-connected for quick, easy changes in length to meet job needs. The specially engineered features of BAY CITY booms are typical of the thorough attention to detail which goes into every BAY CITY.



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11

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EXTRA FLEXIBILITY — Without sacrificing other qualities, Tuffy draglines and scraper ropes are built of the finest steel and designed for the special purposes — to take sharper bends, angle pulls and rapid line speed.

EXTRA ABRASIVE RESISTANCE — Super tough construction of TUFFY special purpose ropes gives them maximum resistance to drum crushing abuse, crowding on guide roll flanges, etc.

EXTRA TOUGHNESS — Union-formed (preformed) TUFFY construction resists heavy line pull, multiplied shock of load on slack line, the stresses of all types of material.

EASY TO HANDLE — Because TUFFY special purpose ropes are more pliable—spool better, ride better on grooves, bug drums when casting on draglines.

Tuffy ROTARY LINE
Designed for portable and standard rotary rigs. Tuffy Rotary lines are the choice in all well drilling operations for ultimate drilling economy.

Tuffy CHOKER
Wire rope specially constructed and selected for extra strength, smoothness, flexibility required in logging.

Tuffy MINING ROPE
Union-formed for mining machine operations. Stronger, safer, withstand abrasion and crushing longer. Easy to handle—flexibility is built in!

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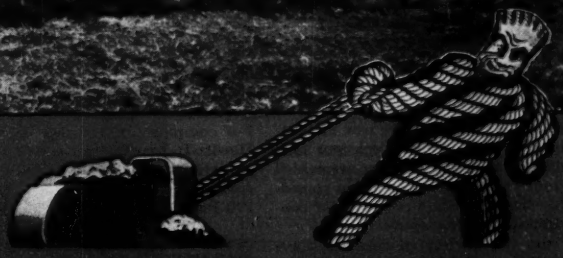
The Easy Way to Order TUFFY Special Purpose Ropes

It is to forget all about complicated wire rope specifications — all you need to do is to specify the diameter and the length and the name TUFFY Scraper, TUFFY Dragline or TUFFY Sling. Union Wire Rope engineers have developed wire rope constructions and wire fabric constructions to serve universally in specific fields of operation. All you need is — Length, Diameter and the name TUFFY!



Tuffy SLINGS

SUPER-FLEXIBLE, Super-STRONG—the Tuffy Sling runs freely, bird rises. Because the specialized rope base evenly over those you are dragging does without material damage. Even cutting any one of the 9 parts of the interlaced wire fabric will not ground the sling. With every type of hitch, under any kind of load or pull, TUFFY Slings have proven their superiority. Each Tuffy sling is proof-tested to twice its safe working load. The reinforced construction makes possible eye splices with 95% of the fabric strength.

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New "Packaged Unit" designed for aggregates, coal, coke, ores and other bulk materials

Equally applicable for both small or large scale operations, the new Hewitt-Robins Sectional Belt Conveyor is a packaged unit that can be assembled by your own workmen—and in considerably less time than required for conventional type conveyors.

From the variety of truss sections, head sections and A-frame supports you can select a conveyor system suited to your needs—in length, height, belt width and capacity. And, when you change locations, the conveyor can be disassembled, with sections added or dropped to suit conditions at the new site.

Like all Hewitt-Robins machinery, this new Sectional Belt Conveyor is carefully designed, strongly constructed. It is equipped with world-famous Robins Troughing and Return Idlers with one-shot lubrication. Curved decking protects the return strand of the belt.

And remember, only Hewitt-Robins is able to take single, unified responsibility for a successful Belt Conveyor installation —machinery and belting. For complete information on the new Hewitt-Robins Sectional Belt Conveyor, write today for Bulletin No. 132. Address Robins Conveyors Division, 270 Passaic Avenue, Passaic, N. J.

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HEWITT-ROBINS SECTIONAL BELT CONVEYOR

HEAD SECTIONS—3 types of drives to take motors from 2 hp to over 40 hp. Terminal pulleys (both head and tail) are solid welded steel with cast iron hubs.

TRUSS SECTIONS—2 designs—24" deep in lengths of 6'6", 15'6", 18'6", and 21'6"; 42" deep for greater spans. Side members all-welded construction; diagonal bracing members have jig-drilled holes for quick field assembly.

BENT SUPPORTS—A-frames are available in complete range from 4' to 50' deep—easily erected.

BELT WIDTHS—18", 24", 30" and 36". Lengths up to belt limitation.

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BELT CONVEYORS

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TRANSMISSION BELTING • VIBRATING CONVEYORS, FEEDERS AND SCREENS

of 20 ft. Even automobiles and trucks can be driven onto the studio floor for demonstrations. A special feature is a welded tele-truss, which eliminates diagonal bracing, so that areas under the roof can be utilized for catwalks, studio lighting and other auxiliary functions.

Traffic speed-up—Speed limit on certain sections of the Washington state highway system will be increased from 50 to 60 mph, under a new state law to take effect in June. The sections will be designated by the state highway director.

Lost cottages—Police of the Long Island, N. Y., State Park are looking for the owners of two summer cottages that were deposited on state park property by high winds last Nov. 25, apparently having floated over from the Seaford Harbor area.

Blames it on the birds—According to Ned L. Ashton, a State University of Iowa engineer, Park bridge over the Iowa River at Iowa City is unsafe since supporting members of the 42-year-old bridge have rusted badly. He said sidewalk brackets join the vertical posts of the bridge to form pockets, and the interior of each post is an ideal birdhouse. Bird nests in nearly all of the posts have kept those areas moist, thus speeding the process of rusting.

The hungry sea—Navy jetties at Seal Beach and a pier near Long Beach, Calif., have been blamed by Newport Beach Engineer R. L. Patterson for erosion at that city which, it is claimed, has reduced the beach 11 ft in two weeks. At one point, he claimed, the beach has been eroded more than 100 ft in the last three months.

The Orange County supervisors are calling upon the federal government to restore the beaches. Patterson claims that the Navy's jetties and the Long Beach pier have blocked sand from being carried down-coast by the current.

Mr. Patterson sees pumping sand to the eroding areas as the only answer to the problem. At Surfside, next to Seal Beach, erosion has likewise been extensive. The Navy piped 200,000 cu yd of sand to the beach while building its jetties. In 1947, when the entire residential front was threatened with erosion, a special $250,000 Congressional appropriation was obtained which financed pumping of 1,200,000 cu yd of sand to Surfside and Sunset beaches. Engineers now estimate that 40 percent of this has been washed away.

"Hydrocrane Great for Close-Quarter Digging"

Says Wisconsin Contractor

"With my H-2 Hydrocrane I can handle jobs other fellows can't begin to do," says Bill Johnvin, Mountain, Wis., contractor. "It's great for close-quarter digging, especially under overhanging branches. And I run into a lot of this while excavating basements and putting in septic tanks for folks building homes out in the woods."

Working in a heavily wooded section, Bill Johnvin's Hydrocrane widens and deepens a section of trout stream to make a pond. The telescopic boom and independent boom hoist combination is a real asset in this close quarter digging.

Johnvin excavates about 50 basements yearly, ranging in size from 24 x 24 to 50 x 50 ft., and handles an equal number of septic tank jobs. He has put in as many as three septic tanks a day. This includes digging tank pit, about 70 ft. of trench, and a hole for the dry well — plus setting the tank. Other jobs include loading logs and pulp wood, digging trout ponds and silo pits, and even digging graves.

This contractor says that his Hydrocrane paid for itself in the first year and a half of service, in addition to giving him a fair living.

Two Hydrocrane sizes— ¼-yd. 2-ton, ⅜-yd. 3-ton. Available with clamshell, crane hook, grapple, magnet, bulk materials bucket and catch basin cleaner. Send coupon for full details.

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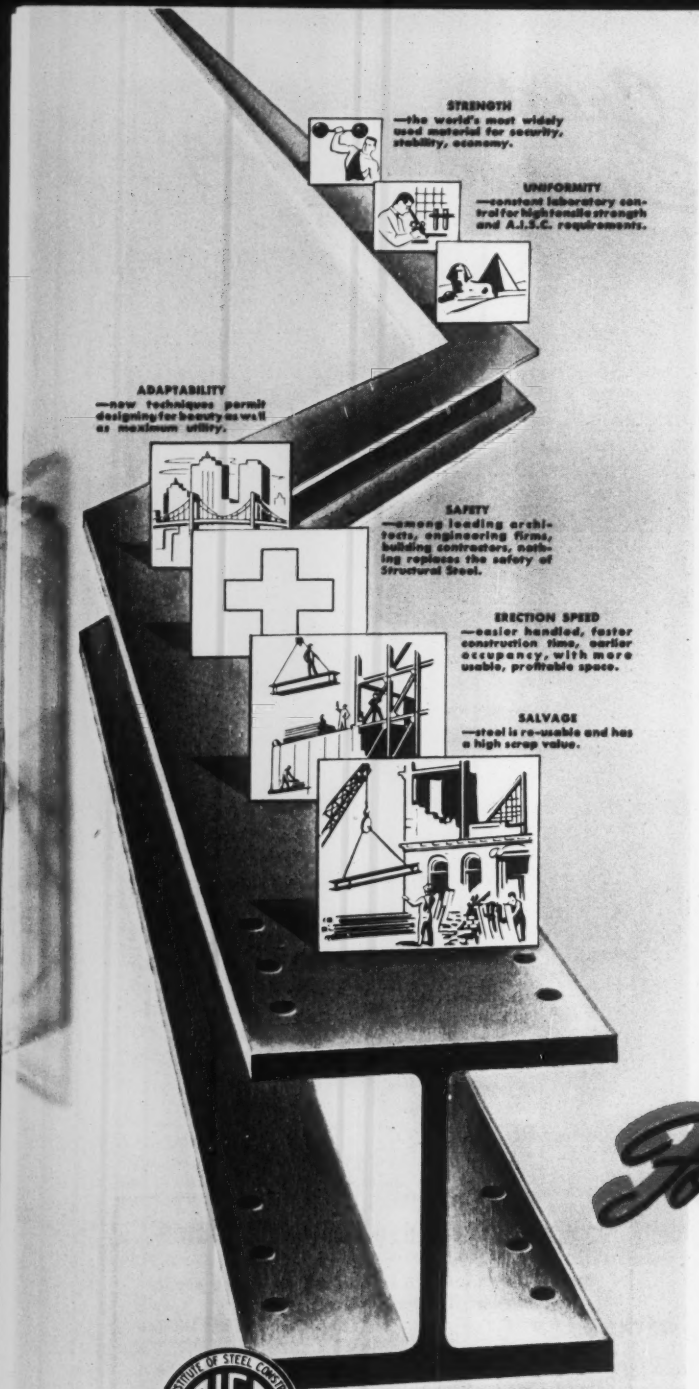
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THE CONSTRUCTION WEEK

ENGINEER MANPOWER PROBLEMS—The Engineers' Joint Council is keeping up its laudable effort to have trained engineers used efficiently under mobilization. Its latest effort is a recommendation to Defense Secretary Marshall that a competent board of military and civilian members be set up in his office to see that engineers and scientists in the reserves are not called from key positions, only to be assigned to routine military duties. Gen. Marshall is sympathetic to the objective, but says that a procedure of screening the majority of cases at a lower level must be developed to prevent swamping a top-level board. Assistant Secretary Anna Rosenberg has been considering a deferment review board at department level.

FIVE YEARS FOR NIAGARA—First power from the proposed redevelopment of Niagara Falls (ENR Feb. 1, p. 31) would not go on the line for five years, according to Col. W. E. Potter, assistant chief of the Corps of Engineers for special projects. He told a House subcommittee that the project probably can be started one year after design is begun. Authorizing legislation has been introduced in Congress. It has been estimated that capacity at the falls can be increased from the present 440,000 kw to 1,572,000 kw.

HOUSING STARTS CONTINUE HIGH—The Bureau of Labor Statistics reports that housing starts for March were 93,000—making a total for the first quarter of 260,000. The figure for December has undergone another revision. It now stands at 93,600.

CUT IN HOUSING DATA—There won't be any BLS figures on housing starts after July if Congress backs up the report of the House Appropriations Committee. The Committee cut the agency's fiscal 1952 funds for housing and public construction from $650,000 to $150,000. Some of the money may be restored—probably in the Senate. In that event, differences will have to be resolved in conference before the two houses pass a final bill.

MATCH OR LOSE—Federal grants of more than $3,700,000 to Maine are going unclaimed, according to Chief Highway Commissioner Lucius Barrows, because the state has not raised the matching money. Part of the offer will expire next June 30; all will lapse by June 30, 1952, unless obligated by the state before then.

TAPPAN ZEE BRIDGE SITE LEGALIZED—Legal obstacles to construction of a $50-million bridge over the Hudson River at Tarrytown, N. Y., were removed last week with the signing of legislation freeing the area for bridge construction. A link in the New York Thruway, the bridge is opposed by local residents. It will cross one of the widest reaches of the river.

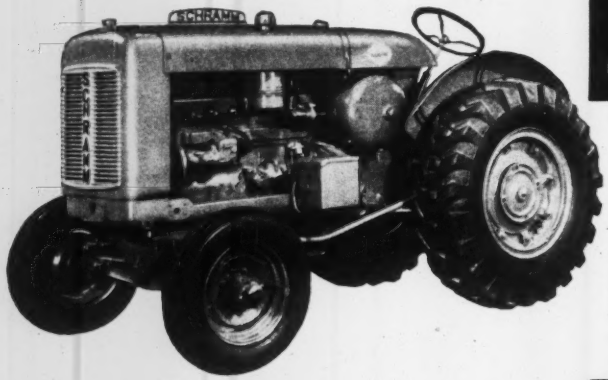
ORE RAILWAY TO BE SPEEDED—Construction of Canada's major new railway line, from the Gulf of St. Lawrence at Seven Islands to the great Quebec-Labrador iron ore deposits, is to be accelerated. Completion now is anticipated within three years, instead of the four years estimated earlier.

SCRAPPY INVENTOR—In 1942, the government took $1,622 in taxes from Arsham Amirikian, a Navy engineer, on a $6,850 award he received as co-inventor of a method to weld drydock caissons, instead of riveting them, saving the Navy millions in dollars and at least 120,000 tons of steel. Later, he started proceedings to get his tax back—contending that the award was a gift. A federal judge has agreed; ruled he should have it back, with interest for nine years.

SAVE MAN-HOURS

while doing these important construction jobs with the

SCHRAMM Pneumatractor



FRONT END LOADER

DRIVING SHEET PILE

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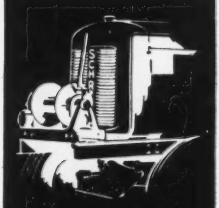
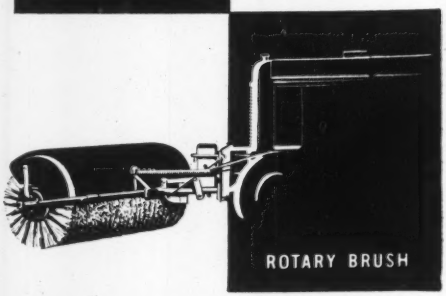


FRONT WINCH

CONCRETE BREAKING

EARTH SPADING



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CONSTRUCTION TRENDS

OUTLOOK BRIGHT FOR ROADS; STEEL ALLOCATION EXPECTED

A high level of highway construction is in prospect for this year. 1951 volume of new highway construction should run close to last year's figure of $2,425 million.

Availability of materials, particularly steel, will determine the final size of the construction program. So far nobody—in government or out—can predict definitely what the volume will be.

But defense officials, from Mobilization Director Charles E. Wilson on down, are pretty well convinced of the need for supporting the highway program. They see highways as an essential part of the transportation system—and they want to avoid the World War II mistake of letting the highways go to pot.

As a result, top people in defense agencies will see that highways get steel for a steady construction program and for maintaining existing roads.

A sharp turn toward total mobilization could change this outlook. But present indications favor a continued good volume of roadbuilding.

MAIN PROBLEM: STEEL—Steel is the key material in determining the volume of highway construction.

Steel requirements for construction and maintenance of highways are estimated at about 1.8 million tons a year. These requirements include plate, shapes, bars rods and sheet. Most of this steel goes into new roads —maintenance takes less than 10% of the total.

The Bureau of Public Roads is trying to keep steel moving into highway-building. BRP is acting as claimant agency for all U. S. highway construction and maintenance.

At present, BRP gives spot assistance to going projects that have trouble getting materials, especially steel. The bureau gets DO orders from NPA for the needed material. So far, steel allotments have been adequate to assure normal construction up to July.

By then, highway men hope that BRP will be getting a regular quarterly allocation.

Idea is for the bureau to pass out steel through its present set-up for disbursing Federal Aid funds. BRP would allot steel to the states. Then states would parcel out highway steel for their own use and for use of counties and municipalities. This system would have the big advantage of working through long-standing, well-established administrative machinery.

Some special types of projects are almost sure to get less steel—no matter what the control arrangements. Mr. Wilson has indicated that the New York and Oklahoma Thruways can't count on getting steel, and some highway officials expect a drop in starts on structural steel bridges.

But, in general, prospects look good for road-builders to get most—may be even all—of the steel they need for a normal construction program.

VOLUME STILL HIGH—U. S. highway construction should run close to normal volume in 1951—even if steel or other materials are cut back slightly later in the year.

Figures for the first three months show the trend. Construction expenditures for highway work put in place amounted to $285 million—16.3% above the same period last year.

Contract awards by state highway departments bettered last year, too. This year's state highway awards—including both Federal-Aid and non-Federal-Aid roads —totaled $267 million in the first three months, $5 million higher than last year.

On the Federal Aid program alone, construction was in progress at the end of March on more than 3,400 projects costing more than $1 billion. More than half of the work was still to be done.

1951 spending for highway maintenance—less dependent on the steel supply should equal or surpass last year's $1.35 billion.

MORE BIG PLANS—State highway departments are laying out plans for even more construction. By the end of March, the Bureau of Public Roads had approved nearly 1,100 projects costing more than $170 million. These projects were ready to be advertised for bids.

For the longer run—over the next two years—the states have programmed some 4,000 Federal-Aid jobs, at an estimated cost of $690 million. BRP has laid aside money for these projects.

In addition, nearly $470 million in Federal Aid remains to be obligated. With the states matching these funds, they will account for about $940 million of new highway construction.

THE OUTLOOK—Barring unforeseen changes, the volume of work on Federal-Aid projects is expected to reach about $900 million—compared with $830 million last year.

Other highway spending should hold fairly steady. Last year states spent $1,703 on new work (including Federal-Aid); counties spent $356 million; municipalities, $297 million; and the federal government spent $69 million on its own projects. Expenditures should approach these figures in 1951—with an increase for purely federal projects.

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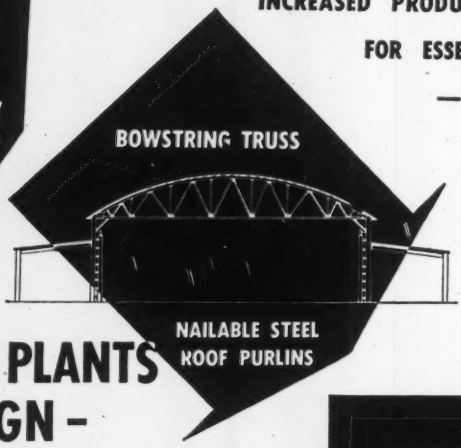

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Future full of promise

INDUSTRIAL EXPANSION NEWS has come at such a fast pace during the first quarter of this year that the full meaning of some of the developments may not have been appreciated. For the construction industry the meaning seems unusually significant. It points to a future full of promise.

Take only the steel industry—to which the NPA has already granted certificates of necessity for the construction of 16 million tons of additional ingot capacity. The money value is about $1½ billion, a sizable amount, but only a small beginning to the billions that this initial investment will generate. Ingots are not useful as ingots. They must be converted into sheets and shapes, and then into fabricated products.

One of the top economic analysts of the country has calculated that the addition of 16% to the nation's ingot capacity is much more than the $100-a-ton job that the NPA figures show. When new raw material and finishing facilities are taken into account the cost is nearer $250 or $300 a ton. That makes the total $4½ billion instead of $1½ billion.

This analyst goes farther and estimates that to use this additional steel will require an investment by steel-using industries of between $1,000 and $1,500 a ton. That's perhaps 20 billion dollars. And there is not enough ore to make this additional steel without going to Labrador or Venezuela. Development of new ore sources adds $1½ billion more. Here's a grand total of $26 billion of investment—at least half construction—that is set in motion by an initial investment of $1½ billion.

Another significant development affecting construction relates to the permission for accelerated depreciation of new industrial facilities for tax purposes. More than $4 billion of industrial expansion has moved toward the construction stage since this fast tax-write-off provision went into effect.

These two examples are typical of the types of economic news that often hold a hidden significance for construction. Analyses of economic and business trends are sometimes in the same category, and one of the most thought-provoking of these is a product of the McGraw-Hill Economics Department.

Made before the Korean war, as a study of the economic potential of the U. S. in the 1950-1960 decade, it concluded that total national output could reach 315 billion dollars in 1960, up 18%; and that annual business capital expenditures could reach $25 billion compared to the $21 billion in 1950.

Under the pressure of defense needs, of course, progress along this road has been speeded up. Yet, as the study indicated, the progress was in the cards regardless of war threats.

Once the possibility of a promising future is accepted and believed in, a major step toward its attainment has been made. One way for construction men to nail down this belief is to recognize important growth factors when they appear. They are amply apparent today in the industrial building field, providing a real basis for facing the future with courage and optimism.

Interstate agreements strengthened

INTERSTATE AGREEMENTS as a means for meeting problems that go beyond political boundaries were greatly strengthened by the Supreme Court's finding that the legislature of West Virginia had not violated the state's constitution when it agreed to participate in an interstate program for cleaning up the Ohio River. The legal battle that was ended by the court's decision began when the State Auditor of West Virginia refused to approve the legislature's appropriation of $12,250 as the state's contribution toward the operating expenses of the Ohio River Valley Water Sanitation Commission, an interstate agency set up under an eight-state compact signed in 1948.

The immediate effect of the Supreme Court's finding is to assure continued participation of both West Virginia and Pennsylvania in the Ohio River pollution-control work because the Pennsylvania legislature predicated its participation in that work on like participation by West Virginia. But the decision can be expected to have a more far-reaching effect since it answers questions relating to interstate compacts that have troubled those who have advocated the use of such compacts for solution of the problems raised by the need for controlling the use or contamination of the waters in interstate streams.

The court held that the West Virginia legislature had the power to make a "reasonable and carefully limited delegation of power to an interstate agency." And Justice Robert H. Jackson, in a concurring opinion, said: "Whatever interpretations [West Virginia] may put on the generalities of her constitution, she is bound by this compact."

These two questions, which are basic to the proper functioning of interstate agencies, have never been so clearly answered before. And although the court's decision related only to what the West Virginia legislature could do under that state's constitution, it seems reasonable to conclude from the wording of the decision that it will be found to apply to all existing and future interstate compacts.

The court's findings should strengthen existing compacts. They may also cause state legislatures to examine with greater care the provisions of new compacts. But in the end any compact written or accepted in the light of the court's findings must be a more effective document. It cannot be nullified by capricious acts of legislative assemblies or state officers.

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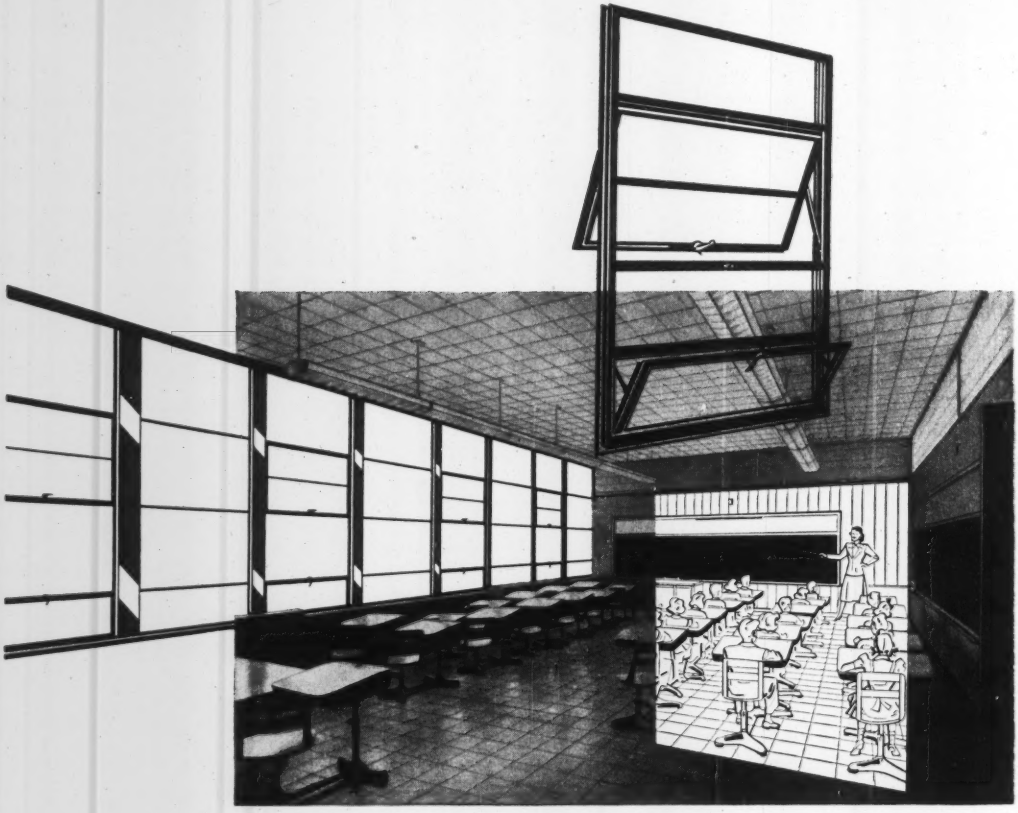

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Full-height metal windows, like the Truscon Architectural Projected Steel Windows in the Wapakoneta, Ohio, School shown above, *let more of the outdoors in* and *more vision out*, to relax the eyes and the body.

Credit: Strong, Strong & Strong, Architects. John A. Johnson & Sons, Inc., Contractors

Truscon Architectural Projected Steel Windows are especially recommended for use in any building where ample ventilation and freedom from drafts are important considerations. Outward projecting ventilators may be kept open during inclement weather; the ventilator acting as a canopy to deflect the rain and yet allow ventilation. The lower, inward projecting ventilator prevents drafts by deflecting air currents towards the ceiling.

See Truscon's complete catalog in "SWEET'S" for full information on all Truscon *Mark of Merit* Products.

TRUSCON MARK OF MERIT PRODUCTS

TRUSCON® STEEL COMPANY

YOUNGSTOWN 1, OHIO

Subsidiary of Republic Steel Corporation

ENGINEERING NEWS-RECORD

APRIL 19, 1951 VOL. 146 NO. 16

NPA sets CMP date July 1; construction work affected

Controlled Materials Plan will allocate steel, aluminum and copper for essential uses, leaving residue in free market—Steel again is key problem

The National Production Authority announced last week that its long-planned Controlled Materials Plan will go into effect July 1.

Basically the same as the CMP of War II, the plan differs slightly this time in that it will not allocate the total available supplies of steel, copper and aluminum. Because mobilization in the present emergency is less than complete, the planners feel they need make allocations only for defense and essential civilian needs. They will leave the rest of the available supply of critical metals in the free market, to be bought by producers of consumer durable goods—automobiles, refrigerators, washing machines.

Construction will feel the effect of CMP at many points. Planning won't crystallize into final decisions until late May or June, but the present thinking is pretty definite on allocations to defense construction and allotments to defense-supporting industrial plants—steel, aluminum and others.

• **Steel is problem**—As NPA Administrator Manly Fleishmann expressed it last week, the crux of the construction problem is structural steel. The defense program, plus new steel mill construction could take nearly the whole supply of structural steel. There would be none for hospitals, schools and other essential civilian structures.

That fact illustrates one of the reasons for CMP: To strike a balance between demand and supply. Defense requirements for structural steel will have to be adjusted to leave some for other essential purposes.

Parallel thinking by CMP planners looks forward to allocations of steel, copper and aluminum for the essential civilian programs. These quarterly allocations would be made to the claimant agencies for the various programs. For example, the Bureau of Public Roads probably would get the highway allocation, and the Office of Education would handle the allocation for schools.

A battle is under way over some of the claimant agency assignments. The issue will have to be decided—at least tentatively—by May 1. At that time, NPA will issue its first list of programs essential to the health, safety and welfare of the economy. CMP Regulation 6, covering construction, should be ready about the same time.

• **First come forms**—During May, the claimant agencies—including industry divisions in NPA—will send out forms (CMP 4C) to owners and builders of construction projects. Any owner or builder who wants to have his project considered for materials allotment should fill out one of these forms. The form will ask for the materials requirements and construction schedule, among other things.

After a claimant agency receives the data for projects in its program, it will present its total quarterly requirements to the Office of Program and Requirements in the Defense Production Administration. The requirements committee of DPA will decide how much the figure for each quarter must be scaled down to bring supply and demand into balance.

• **Then allocations**—In this case, supply means the total quantity of allocated material. CMP planners have been talking about allocating 85% of the available steel: 21% for military orders, 34% for other rated programs, and 30% for a B list of stock items—such as roller bearings and small motors—that are widely used as components or parts in many manufactured products.

This distribution of steel would leave only 15% in the open market for consumer durables. Automobile manufacturers and many other producers would raise a howl. Final decision on the actual percentages for CMP allocation will have to be made by the highest authority, Defense Mobilizer Charles E. Wilson or—more probably—President Truman.

After a claimant agency receives its quarterly allocation, the agency parcels out the allocated materials among

(*Continued on page 24*)

ALL SMILES—President Truman poses on the White House steps with the new defense mobilization advisory board. L. R., first row: David Brooks, Atlanta, farmers' cooperatives leader; Defense Mobilizer Charles E. Wilson; the President; Philip Murray, CIO president; and Walter Reuther, president, CIO auto workers. Second row: Samuel A. Smith, Chelsea, Mass., manufacturer; George Meany, AFL secretary-treasurer; William H. Davis, New York attorney; Otto A. Seyferth, Muskegon, Mich., president, U. S. Chamber of Commerce; Claude A. Putnam, Keene, N. H., manufacturer. Third row: James G. Patton, Denver, president, National Farmers Union; George H. Mead, Dayton, Ohio, manufacturer; Paul Porter, Washington attorney; Herschel D. Newsom, Columbus, Ind., master of the National Grange; and Marion B. Folsom, Rochester, N. Y., executive. (Wide World photo)

High court affirms Ohio River Compact

In last week's decision on the obligations of West Virginia to the Ohio River Valley Water Sanitation Commission, the Supreme Court went as far as it judically could to sustain the validity of interstate compacts. A unanimous court ruled the Ohio River Compact valid and binding upon West Virginia, one of the eight states that are parties to the agreement.

The case goes back to refusal by West Virginia auditor Edgar B. Sims to approve payment of $12,250 appropriated by the legislature as the state's contribution to the expenses of the Ohio River Commission for the fiscal year 1949-50.

The issue was carried to the state's Supreme Court of Appeals, which found invalid the West Virginia act of 1939, approving the compact, on two grounds: (1) The compact was deemed to delegate West Virginia's police power to other states and to the federal government; and (2) It was deemed to bind future legislatures to make appropriations and thus violate a provision of the state constitution.

In its opinion the U.S. Supreme Court confined itself to these two points. On the major issue, the court verdict, written by Justice Frankfurter, had this to say:

• **Legal document**—"* * * A compact is after all a legal document. * * * Just as this court has power to settle disputes between states where there is no compact, it must have final power to pass on the meaning and validity of compacts. It requires no elaborate argument to reject the suggestion that an agreement solemnly entered into between states by those who alone have authority to speak for a state can be unilaterally nullified, or given final meaning by an organ of one of the contracting states. A state cannot be its own ultimate judge in a controversy with a sister state. To determine the nature and scope of obligations as between states * * * is the function and duty of the Supreme Court of the nation."

• **State grant of power**—Further, the opinion goes on to declare that a state may delegate its powers to an administrative body outside the state. Said the court:

"We are not here concerned, and so need not deal, with specific language in a state constitution requiring that the state settle its problems with other states without delegating power to an interstate agency. What is involved is the conventional grant of legislative power. We find nothing in that to indicate that West Virginia may not solve a problem such as the control of river pollution by compact and by the delegation, if such it be, necessary to effectuate such solution by compact."

On the separate question of West Virginia's commitment to support the Ohio River Commission by appropriations, the Supreme Court concluded that the obligation of the state under the compact is not in conflict with the constitution of the state.

CMP plan set

(*Continued from page 23*)

its projects. Thus it is up to the claimant agency to decide which new projects will get materials to go ahead and which must be deferred. This amounts almost to life-or-death power, and people responsible for public and private works want the potent authority to be lodged in agencies that know their business thoroughly. (Many water and sanitation officials, for example, want to have the Public Health Service as claimant agency in their field, rather than the Housing and Home Finance Agency.)

A claimant agency might redelegate its authority for selecting projects. Thus the Bureau of Public Roads could apportion its quarterly highway allocation among the states. Each state then would reallocate portions to its counties and municipalities and would assign the remainder to rated projects on the state system.

• **Effect**—Real effects of CMP won't be felt until the fourth quarter of the year. In the third quarter, both construction jobs and production plants will be consuming materials ordered before July 1. By the end of the year, the plan should become fully effective.

Construction jobs by that time will be getting materials ordered on the basis of preference ratings assigned to the projects. The orders will be more effective than DO priorities in use today. They will have the advantage of assured delivery on schedule, as a result of prior balancing of the orders against the supplier's ability to produce and ship.

Confusion causes violation of construction controls

The government last week discovered considerable confusion among businessmen concerning controls on materials.

The National Production Authority says that 205 out of 409 alleged violations of all types of materials controls investigated involved the M-4 construction order. The NPA staff added that many of the violators were not aware that M-4 banned some types of construction and required governmental approval for others.

Preliminary reports on two surveys of industry compliance with materials regulations—conducted by the NPA and the Federal Trade Commission—show that 55% of the aluminum fabricators, for instance, are violating NPA orders. The bulk of the violators either were ignorant of the meaning of materials controls, or were unaware of their existence.

Metals become increasingly critical

The metal supply situation is in a whirl as vital construction materials drain into defense production.

A checkup on the status of 17 important metals and minerals under NPA controls reveals:

Steel going into defense at the rate of 40% of output (according to U. S. Steel).

Lead in an unbalanced supply-demand relationship, imports down, demand outrunning supply an easy 16%, and its use curtailed by NPA. More controls are likely.

Zinc inventories down since Korea, but not as critically short as in World War II.

Nickel still short in spite of tightened controls with a new list of civilian products in which nickel is banned.

Copper now a "program" material.

Under order M-50 of the National Production Authority 92.7 million pounds of copper has been allotted to the electric utilities for the second quarter of this year.

This allocation allows 87.3 million pounds of copper conductor, and 5.4 million pounds of copper forms and shapes for construction.

But utilities are restricted as to the amount of copper they can put into maintenance and minor improvements. Only some 18% of the gross weight they used for similar purposes in 1950, or 75% of the amount they used in the like 1950 quarter—the utilities have their pick—can go into like purposes.

• **Steel control ahead**—The Defense Electric Power Administration also will try to bring steel in under M-50. Conferences to this end are meeting and will involve the automobile industry which may be told this spring just what to expect for output goals.

Army Engineers decentralize buying; this year's funds get fully allotted

Slowdown in expenditures foreseen, but no dropoff in construction or procurement plans—four regional offices found "spent up"

Decentralization of Army Engineer procurement and the commitment of nearly all of the $659 million allotted so far this fiscal year for single-service procurement of construction materials and equipment does not mean a reduction of Defense Department construction or procurement plans.

There will be some slowing down until June 30, end of the fiscal year, while the engineers are going on money out of supplemental Defense Department funds.

This represents an adjustment to timing problems arising from extra late appropriation requests on the part of the administration. (ENR Feb. 15, p. 26)

• **A late request**—President Truman is asking $6 billion of the $10 billion expected. Later requests will make up the difference.

Figures for the Defense Department will be submitted to the Budget Bureau by the end of this month. The President's official request will come along later.

Meanwhile the Corps of Engineers has expanded its construction procurement organization by activating military supply sections in four of the Corps District Engineer's offices. These four will supplement the Chicago procurement office.

• **The four spenders**—Procurement money allotted so far this year includes: $335 million for construction equipment (handled by the Chicago procurement office); $75 million for construction materials (handled at the St. Louis procurement office); $75 million for bridges and floating equipment (handled through Pittsburgh); $49 million for utilities equipment (Philadelphia), and $22 million for mapping, reproduction and special equipment (New York).

The fact of decentralized procurement makes it not only unnecessary but undesirable for sales representatives to go to Washington to solicit military supply procurement business with the Corps of Engineers.

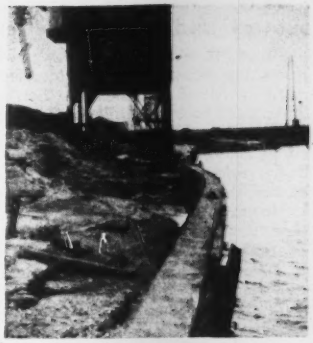
Final word on purchases of agricultural machinery and implements, augers, bituminous paving machinery, conveyors, cranes, plows, rollers, scrapers and various types of tractors will rest in the office at Chicago.

• **Meet me in St. Louis**—St. Louis district office will concern itself with construction materials including asphalt, plumbing fixtures and specialties, wire, cloth, basic gypsum products, lumber and reinforcing and structural steel. Included in this category will be roofing of all types, tubing, fencing and netting wire, both barbed and smooth. Also pipe, nails, spikes, and tubing.

• **The Philadelphia story**—In contrast, the Philadelphia office will handle air conditioning equipment, pump, disposal plant equipment, and distillation equipment purchases.

DPA sets up steel program for 5 construction areas

The Defense Production Administration has made program decisions that will provide about 1.2 million product tons of steel for 19 essential programs in May and 1.5 million product tons for 23 programs in June. These programs involve either defense-supporting or essential civilian activities. Steel so allocated will be used to fill orders that carry DO ratings or are otherwise certified by claimant agencies with concurrence of the National Production Authority.



RUBBER CONCRETE?—Here's what happened to a waterfront bulkhead retaining wall in South Amboy, N. J., when coal was piled too high behind the wall. A section 200 ft long was pushed out of line for a maximum of six ft. Owner of the coal worked fast—with bulldozer and scraper—to unload the area.

Highways receive an allocation of 151,000 product tons for each of the two months. The 151,000 tons for each month is allocated to the Bureau of Public Roads, agency for highways.

For June, the Office of Education in the Federal Security Agency has an allocation of 24,869 tons for schools.

Local Army Engineer Procurement Offices

Army Corps of Engineers procurement service offices are located in the following seventeen cities:

South Atlantic Division
P. O. Box 1889,
Atlanta, Ga.
New England Division
P. O. Box 2316
Boston 7, Mass.
New York District
80 Lafayette Street
New York 13, N. Y.
Pittsburgh District
925 New Federal Building
Pittsburgh 19, Pa.
Philadelphia District
P. O. Box 8629
Philadelphia, Pa.
Louisville District
P. O. Box 59
Louisville, Ky.
Fort Worth District
1127 Texas and Pacific Building
Fort Worth, Texas
Buffalo District
Engineer Park
Buffalo 7, N. Y.
Los Angeles District
751 S. Figueroa St.,
Los Angeles, Calif.
Chicago District
520 Merchandise Mart,
Merchandise Mart Plaza
Chicago 54, Ill.
St. Louis District
Room 834,
U. S. Courthouse & Customhouse
St. Louis 1, Mo.
Detroit District
Rm. 2015 Cadillac Tower
65 Cadillac Square
Detroit 26, Mich.
San Francisco District
P. O. Box 3050—Rincon Annex
San Francisco, Calif.
Seattle District
4735 East Marginal Way
Seattle 4, Wash.
St. Paul District
1217 U. S. Post Office &
Customhouse
180 E. Kellog Blvd.,
St. Paul 1, Minn.
Rock Island District
Clock Tower Bldg.,
Rock Island, Ill.
Milwaukee District
P. O. Box 744
Milwaukee, Wisc.

Samuel R. Rosoff dies, subway and tunnel builder

Samuel R. Rosoff, 68, subway and tunnel builder, died in Baltimore, Md. April 9. Mr. Rosoff boasted that he never went to school a day in his life. Born in Russia, he came to this country in 1895 and started out as a newsboy. He wound up his career as a millionaire.

He learned one day that the Cape Cod canal would need 2,000,000 tons of stone for breakwaters. During most of 1908 he collected waste stone from quarries and when the company building the canal got ready to buy stone it found that Rosoff had practically cornered the market. That deal netted him $200,000 and gave him his start as a contractor.

Eventually he headed the Rosoff Subway Construction Co., and in 1925 he got his first subway contract — for the construction of about ten blocks of subway under St. Nicholas Ave., New York City. He got many other subway and tunnel contracts. Then he branched out into the purchase and revitalizing of small railroads, a business he continued till his death.

Plumbers, employers settle local issues successfully

A labor-management sponsored industrial relations council is settling local disputes in the plumbing and pipefitting industry without setting its machinery in motion at all.

Although the council was established last July, no case has been submitted. An officer of the National Association of Master Plumbers believes this is because the union and the employers are required first to agree on what the issues are. "That step is half the battle," he said. "When they've decided the issues, they can wind up negotiations themselves."

The council is made up of the Master Plumbers, the Heating, Piping and Air Conditioning Contractors National Association, and the United Association of Journeymen and Apprentices of the Plumbing and Pipefitting Industry (which claims 200,000 members). The employer associations each have two members on the council. The union has four.

Basic requirements for submitting a case are: All local-level avenues must be exhausted before disputants may apply; they must submit jointly a voluntary application stating what the issues are, and agree to accept the council's decision; they must call off any strikes or lockouts; both parties are required to submit briefs and exchange them with each other.

Admiral Manning heads James Stewart & Co.

Vice Admiral John J. Manning (CEC) USN, Retired, formerly Chief of the Bureau of Yards and Docks, United States Navy, has been named president and director of James Stewart & Co. Inc., contractors of New York, Chicago, Dallas and Washington.

Admiral Manning, who is 57, is a graduate of Rensselaer Polytechnic Institute, 1915. He also attended the Naval Academy for a time. He joined the Navy's Civil Engineer Corps in 1917 as a lieutenant, jg. His first work for the Navy was with the Public Works Department, U.S. Naval Base, Guantanamo Bay, Cuba. Later he was in similar work at the Puget Sound Navy Yard, Bremerton, Wash.; and at other naval stations, including Newport, Pearl Harbor and Philadelphia. He became chief of the Bureau of Yards and Docks in 1945. In the war he carried a great part of the responsibility for the execution of landing operations at the Normandy beachhead.

Mo. attorney general says no-strike law is improper

Another attack on state laws that prohibit strikes in public utilities appeared in Missouri last week, when the state's attorney general held informally that the King-Thompson law is unconstitutional.

This was the third time within a few months that such laws have been declared improper: The U. S. Supreme Court recently made the same decision regarding laws in New Jersey and in Wisconsin.

Specifically the Missouri attorney general pointed out that the King-Thompson law, could be thrown out by a federal court, on the ground that it conflicts with portions of both the Wagner Act and Taft-Hartley Act of the national Congress at a number of points.

CIVIL DEFENSE

Micro-filming records—A drive to micro-film all Massachusetts public records and store them in bomb-proof shelters was launched at a recent Boston meeting of the City Clerks' Association of Massachusetts. Members went on record as favoring the micro-filming of all municipal records to protect the rights of citizens in the state in the event of a bombing attack.

Civil defense center—Col. Lester J. Maitland, director of the Michigan State Office of Civil Defense, has selected a site for a civil defense center eight miles from the state capitol. Prefabricated buildings would be erected to store medical and other supplies and equipment and to provide facilities for civil defense training. Conferences are to be held with heads of the University of Michigan, the Michigan State College and Wayne University to determine what training instructions could be devoted to civil defense teams.

Architect recommends shelters—Ralph T. Walker, president of the American Institute of Architects, says: "There is a great deal of work to be done to shelter workers in the places where they work—and this should be done immediately. Every building owner should be forced to make, within his building, the relatively safe, economical shelters which are possible."

Decentralized homes — Prof. R. B. Greely of the Massachusetts Institute of Technology, says that, in his opinion money spent on properly planned and placed new housing on the periphery of the chief target cities would save more persons from atomic bomb attacks than equivalent amounts used for bomb shelters.

Restoring highways—As one of its first steps, an emergency planning committee of the Virginia Department of Highways is working out a plan to provide at short notice the men and equipment necessary to restore highway transportation in the event of damage by air attack or other military action.

State civil defense agency—Governor S. S. McMath of Arkansas has recommended a 2-years' appropriation of $129,200 to operate a defense agency for civilians. Among the services that the civil defense director would be required to provide would be security personnel, a plan for pooling fire-fighting equipment, and an adequate medical program for the injured.

CONSTRUCTION BUSINESS

Fast write-off gets Congress scrutiny

With an apparent easing of Congressional war tension, you can look for further probing into the "fast amortization" (quick write-off of new industrial plants) program that was considered only a minimum step toward needed industrial expansion in the excitement of last fall.

The quick amortization provision is considered by many observers to be the mainspring of the current boom in industrial construction, since it makes possible virtual pay off of expansion costs from current income.

(National Production Authority says in answer to some of its critics—that more than $4 billion worth of new plants or expansions had been made possible through application of the fast amortization provision. What's more, added NPA's report, one-third of the certificates so far approved have been for projects that cost $500,000 or less.)

But, with organized labor sniping at the program on one side and with indications of slipshod work in approving the certificates of necessity for individual business concerns, Congress takes steps to get a closer look.

• **$7 million on $600**—Approval of a certificate and a $7.8 million loan to Hazelton Steel Tubing Co.—a newly organized company whose three principal owners allegedly had only $600 each in the project—has caught the inquiring eye of Senator Burnet R. Maybank, chairman of the Senate Banking Committee. Details on 47 other certificates granted to 21 steel and refractory companies in December have been called up for Congressional scrutiny.

Results: 1. A new plan with a familiar ring from William H. Harrison, head of the Defense Production Administration and Manly Fleischmann, head of the National Production Authority.

2. A slowdown in the granting of new certificates which allow five year write-offs.

• **Another way**—Harrison and Fleischmann answer Congressional griping at the $3 billion to $4 billion in fast amortization by suggesting that the government build specialized plants such as those needed for jet engines or the production of guided missiles.

These plants, they say, could later be sold to industry if convertible to peacetime uses. Otherwise they could be held in reserve. During emergency periods they might be given over to private managements for operation.

These proposals of leading defense production officials are embodied in an amendment drawn up for the Defense Production Act.

• **Fewer certificates**—Reflecting this change in policy is the hold-down on certificates of necessity. To take a few weeks at random:

In the period January 25 through March 7, 313 permits were approved for a $1,813 million total value of industrial expansion.

In marked contrast was the period March 26 through March 30 when 126 permits were approved for $236 million.

The range of the slowdown is obvious. Of course it is also true that during the month past the rate of grants in certification of new war plant is still large in spite of the cutdown, averaging out at around $1.3 billion in March, down $500 million from February.

Actually Congressional worries over fast write-off spring from political as well as administrative questions.

• **Peace and politics**—Labor has long openly called the fast write-off a business tax dodge. With talk of higher personal income taxes to come this fall, there is frank anger in some Congressional circles over taxes escaped by businessmen under this program.

If peace talk continues in Capital circles many vital provisions of the defense building program may suffer atrophy under the glare of unsympathetic, pre-election Congressional investigation and questioning.

It is reliably reported that Harrison would like to return to private life around May 1, if Charles E. Wilson, head of the Office of Defense Mobilization can find a replacement. Harrison would like to see a change of pace via the amendment before he leaves office.

Business Briefs . . .

• **Approvals**—With its local offices continuing a fairly liberal policy on approving commercial structures under order M-4, National Production Authority's Construction Controls Division in Washington has also been reasonably liberal on larger jobs (over $1,000,000 or 50 tons of steel). During the week March 19-23, the division considered 128 applications for $59,000,000, approved 90, for $28,000,000.

• **Urban building high**—Building activity in urban areas in 1950 was at its highest dollar level in history, says the Bureau of Labor Statistics. Measured by building permits issued and federal contracts awarded, said BLS, urban building for the year was valued at $10.4 billion—a 40% jump over 1949.

• **Record steel production**—During the month of March, the U. S. steel industry produced 9,050,000 tons of ingots and steel for castings—an increase of 16.5% over February and 21% over March, 1950. With that production, said the American Iron and Steel Institute, production for the first quarter of 1951 was 26,658,868 tons—highest ever attained.

• **Primary prices steady**—For the fifth straight week (ending April 10) average primary market prices remained virtually unchanged, BLS reports. The overall index (based on 1926) dropped to 183.2. The building materials component held steady at 227.6% of 1926; metals and metal products went up .1, to reach 189.9% of 1926.

• **Lumber orders**—Lumber shipments and new orders continued to top production. In the week ending March 31, shipments were 16% above production, orders 9.9% above, unfilled orders were 63% of stocks. Softwood mills reported that unfilled orders were equal to 30 days' production.

• **Housing drops**—Reflecting, in small degree, the effect of controls, housing starts for March were 93,000 units, said the Bureau of Labor Statistics. Total for the first quarter of 1951 was 260,000 starts. March, 1950, saw 117,300 starts, and first quarter, 1950, totalled 278,900. At the same time, BLS released a final figure for December, 1950, of 93,600, to make the final official total for the year 1,396,000 starts.

• **Backlog climbs**—Continuing a steady upward climb, engineering construction proposed in March (but not yet under contract) move up by $524.9 million, to bring ENR's measured backlog to $55,163,617,000. Average monthly rise this year is now $1 billion, compared to $404 million in 1950.

BIDS AND BIDDERS

(Major project news received after Construction Reports, page 72, went to press.)

Completing McNary Dam—$58,416,490 was the low bid of the McNary Dam Constructors, San Francisco, for completing McNary Dam, on Columbia River, Oregon. U. S. Engineers, Walla Walla, Wash., opened bids April 12. The contracting company, which is now working on the first section of the project is made up of Guy F. Atkinson, Ostrander Construction Co. and J. A. Jones Construction Co.

Sulphate Mill—Nanaimo Sulphate Pulp, Ltd., Vancouver, B. C., plans to expand sulphate mill, at an estimated cost of $16,000,000, with $900,000 docking facilities at Nanaimo, B. C.

Ordnance Plant—Whittenburg Construction Co., Louisville, Ky., will build second section of buildings for rehabilitation of Hoosier Ordnance Plant, Charlestown, Ind., at about $15,000,000. Contract was awarded by U. S. Engineers, Louisville, Ky. Hazelet & Erdal, Louisville, are consulting engineers.

Bridge—State Road Department, Jacksonville, Fla., received low bids April 12, from Industrial Contracting Co., Minneapolis, Minn., for substructure of Gilmore Street Bridge over St. John's River, Jacksonville, at $5,207,832 and from Louis Garavaglia, Detroit, Mich., on superstructure at $4,137,784. Parsons, Brinckerhoff, Hall & MacDonald, New York, N. Y. and Reynolds, Smith & Hill, Jacksonville, are consulting engineers.

Plant—National Union Radio Corp., Hatboro, Pa., has preliminary plans underway for $6,000,000 plant in Philadelphia. W. Ward Easby, Philadelphia, is architect.

Grenada Dam—Edward E. Morgan Co., and Jones & Gillis, Inc., Jackson, Miss., have been awarded a $3,758,255 contract to build the Grenada Dam, in Mississippi, by the U. S. Engineers, Vicksburg.

Barracks, School, etc.—Volpe Construction Co., and Farina Brothers, Boston, Mass., were low bidders at about $8,000,000, for constructing barracks, school and dormitories at Limestone Air Base, Limestone, Me., when U. S. Engineers, Boston, Mass., opened bids.

Engineering Building—Bryant & Detwiler Co., Detroit, Mich., has been given contract to build $5,000,000 Engineering Building at Dearborn, Mich., for the Ford Motor Co., Dearborn. Voorhees, Walker, Foley & Smith, New York, N. Y. are architects.

Steel Plant—Lukens Steel Co., Coatesville, Pa., plans constructing plant expansions, to cost $4,000,000. N. J. Jenson, is chief engineer for owner.

Air Force Base—U. S. Engineers, Fort Worth, Tex., have just selected Freese & Nicholas, Fort Worth, Brasker, Butler, French, James, Mulvaney & Puckett, Big Spring, Tex. and Castle, Olds, Yeatts, Allen, Kanto, Tucker, Lindberg & Collier, of Abilene, Tex. as engineer-architects on $14,000,000 Big Spring Air Base.

Testing Buildings—Penker Construction Co., Cincinnati, O., has been awarded $4,000,000 contract by the U. S. Engineers, Louisville, Ky., for four testing buildings, railroad spurs, and targets at Madison, Ind. Vonnegut, Wright, & Yeager, and Lenox & Matthews & Associates, Inc., Indianapolis, are architects. Allied Architects & Engineers, Indianapolis, Ind., are consulting engineers.

Ethyl Plant Additions—Dow Chemical Co., Freeport, Tex., awarded contract to Tellepsen Construction Co., Houston, Tex., for Ethyl plant addition at Freeport to cost $2,750,000. Rehabilitation of mangesium plant will be undertaken by company forces at about $2,275,000.

Quarters—J. H. Pomeroy & Co., San Francisco, Calif., was low bidder at $4,793,966 for constructing family quarters at Eielson Air Force Base and Ladd Air Force Base in Alaska, when the U. S. Engineers, Anchorage, opened bids on April 10.

Sewage Treatment Plant—City of Hamilton, Ill., plans a $3,000,000 sewage treatment plant. Consoer, Townsend & Associates, Chicago, Ill., are consulting engineers.

Housing—Bids have been extended to May 22, for the constructing of $4,000,000 Otto Bremer Homes Housing Project in St. Paul, Minn. The Housing & Redevelopment Authority of St. Paul will open bids. Associated Architects & Engineers., St. Paul, are engineers and architects.

High School—Board of Education, Wichita, Kan., has approved final plans for $3,250,000 West High School. Thomas & Harris, Wichita, are architects.

Natural Gas System—City of Greenwood, S. C., plans a natural gas system. Estimated cost is $3,930,000.

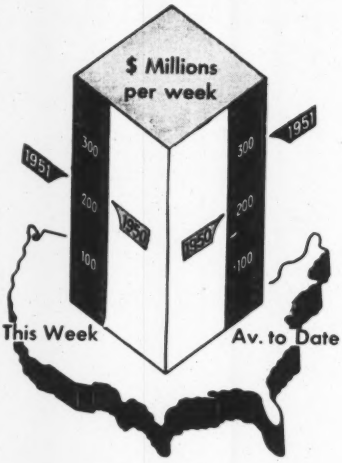
COSTS AND VOLUME

ENR INDEX NUMBERS

Index Base = 100	1913	1926	1949
Constr. Cost. Apr. '51	538.69	258.95	112.93
Bldg. Cost. . . Apr. '51	398.78	215.57	113.36
Volume . . . . . Mar. '51	558	227	161

Activity This Week

As reported to ENR (in millions of dollars)



Amount of contracts let

Week of Apr. 19 '51	This Week	Cumulative 16 wks 1951	1950	% chge
Federal	$52.6	$669.6	$464.1	+44
State & Mun.	69.4	1,114.5	907.8	+23
Total Public	$122.0	$1,784.1	$1,371.9	+30
Total Private	98.8	2,929.0	1,889.1	+55
U. S. Total	**$220.8**	**$4,713.1**	**$3,261.0**	**+45**

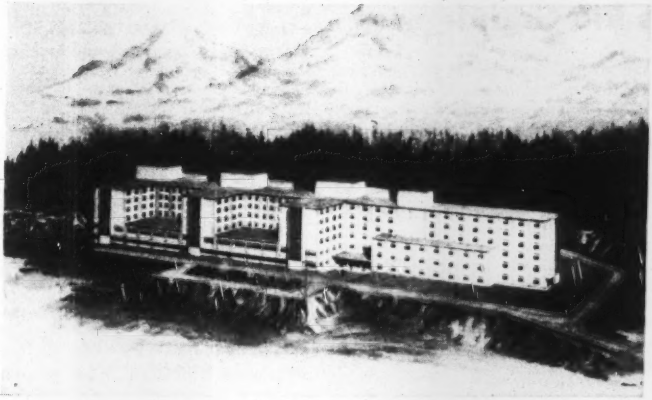
Contracts by type of work

	This Week	Cumulative 16 wks 1951	1950	% chge
Waterworks .	$8.9	$77.6	$80.0	−3
Sewerage . . .	4.5	98.1	71.9	+36
Bridges	6.4	86.5	96.9	−11
Highways . . .	14.9	289.1	298.1	−3
Earthwork, Waterways .	21.8	124.5	123.8	+1
Buildings:				
Public	51.7	772.0	528.7	+46
Housg., pub.	5.6	182.4	63.6	+187
Housg., priv.	32.3	599.0	1,086.6	−45
Commercial .	13.5	212.3	317.5	−33
Industrial . .	47.3	1,753.7	327.6	+435
Unclassified .	13.9	517.9	266.3	+94

NOTE: Minimum size projects included are: Waterworks and waterway projects, $1,000; other public works, $60,000; industrial buildings, $82,000; other buildings, $300,000.

New capital for construction

	Cumulative 16 wks 1951	1950	% chge
Corporate Securities	$571.2	$582.4	−2
Fed. loans, Priv. Constr.	0	0	0
State and Mun.:			
Excl. housing . . .	679.0	580.4	+17
Housing	258.1	198.8	+30
Fed. Aid, non-fed. constr.	73.4	0	0
Total Non-Federal . .	$1,581.7	$1,361.6	+16
FEDERAL	2,602.5	0	0
Total Capital	**$4,184.2**	**$1,361.6**	**+207**



BACHELORS' QUARTERS—Architect's sketch of a six-story, reinforced concrete, $8-million structure planned by the Corps of Engineers for the Army at Whittier, Alaska. The building will be a complete Army post in itself. Living quarters furnish four-man sleeping cubicles for enlisted men, single and double rooms for non-coms, rooms with connecting baths for officers. Facilities include a 300-seat theater, bowling alleys, 16-bed hospital, five classrooms, post-office, jail, chapel, library, hobby shop, mess halls, kitchens, recreation rooms, personal service facilities and two rifle ranges. John W. Maloney, Seattle, is the architect.

Turnpike fixed-fee contract protested

The New Jersey Turnpike Authority is under fire because it awarded a $7,700,000 cost-plus, fixed-fee contract for the construction of an administration building, restaurants and service station facilities on the toll road now being constructed.

The New Jersey Association of Master Plumbers, the Heating, Piping and Air Conditioning Contractors of North Jersey and the Gumina Building Contracting Co. of New Brunswick, N. J., have all protested to the State Senate Judiciary Committee against the award of the contract to A. A. LaFountain of Hackensack, N. J., and August Arace & Son of Elizabeth, N. J. The contractors' fee in the contract was 2% or $154,000.

The committee is expected to report on April 23rd.

Paul L. Troast, chairman of the New Jersey Turnpike Authority, has defended the procedure on the ground that it is necessary to insure completion of the superhighway on time.

One of the points raised by the protesting contractors is that such an award is prohibited by New Jersey law. Troast said the prohibition relates to state contracts other than those let by the Turnpike Authority.

The chain of events leading to the fixed-fee award began when the Turnpike Authority advertised for bids on the administration building. The Gumina company was low with a price of approximately $1 million, which was some $250,000 more than the engineers' estimate.

Turnpike officials then decided to add the restaurants and service stations to the contract and bids were asked on the complete job. Again the bids were too high, and the fixed-fee contract was awarded.

• **For the hungry**—A contract was awarded last week to the Howard Johnson Co. to operate the initial nine lunch rooms and two restaurants on the 118-mile turnpike. Johnson, operator of food units on the Pennsylvania, Maine and New Hampshire Turnpikes, was the highest bidder—guaranteeing a minimum annual rental of $300,000.

Bids will be solicited soon for 13 gasoline stations.

Concession revenues are expected to approximate $604,000 during 1952 and rise to $950,000 yearly by 1956.

Island-link bridge for Quebec to cost $3 million

A new bridge across the St. Lawrence River has been announced by Premier Duplessis of Quebec, to be undertaken as a project of his provincial Public Works Department.

The new bridge will link the town of Valleyfield, at the extreme western end of the province of Quebec, with that part of the province lying north of the river. The bridge will actually be a series of three or possibly four structures, joining various islands.

Canada plans building growth for production

$4,328 million for 1951 foreseen by Minister of Trade and Commerce—Alberta gas for U. S. copper plant

Nearly 22% of the gross national production of Canada this year will go eventually into new buildings and equipment, if unforeseen shortages do not thwart plans for new construction by both industry and government.

This is a major finding in a special review of private and public investment tendencies in Canada—presented last week to the Canadian Parliament by the Minister of Trade and Commerce, C. D. Howe.

The total of private and public capital expansion planned for 1951 is $4,328 million, an increase of 14% over 1950. This figure is believed to set an all-time record on a per capita basis for any country.

Every province except Prince Edward Island is expected to share. Newfoundland, with an increase over 1950 of 41%, tops the list percentagewise. The maritime city of St. John, New Brunswick, leads all the cities with a whopping increase of 873%.

Iron and steel lead the industrials in planned expansion, with an outlay expected to reach $128 million. New works and equipment for private and public utilities are to cost $982 million.

• **Natural gas for U. S. copper**—A special bill has been passed by the Alberta legislature that will permit the province to supply vital defense operations of the Anaconda Copper Mining Co., Ltd., in Montana with natural gas for the next five years.

The pipeline necessary is to run 21 mi to the international boundary and another 35 mi to the Cutbank, Mont., field, where it would link with Montana Power Co. pipelines.

Alberta will get a royalty, the participating oil companies a profit and Anaconda Copper cheaper power under terms of the plan. The act provides that Alberta may reduce or cut off the supply at any time if it is found that the gas is being used for other purposes than defense production.

Rescue squad

Personnel of building contractors and building trade unions in the Rochester, N. Y., area will cooperate to form the rescue squad group of the city's civil defense organization, Harry W. Bareham, assistant Civil Defense director, announced. The combined groups will engage an estimated 1,500 persons in the rescue squad organizations.

Serious drought hits Rio Grande area

Citrus fruits and other irrigated crops in the lower Rio Grande valley are taking unprecedented punishment due to a combination of abnormal freezing weather, subnormal precipitation over the area and unusually low flow in the river.

At the same time, the placing of additional areas under cultivation, in Mexico as well as in the U. S. has resulted in more than normal demand for irrigation water from the river.

Best barometer of the amount of water available for irrigation along the lower Rio Grande is the government gaging station at Rio Grande City, Tex., considered the point of supply of river water to the lower valley.

Monthly discharges past this station, according to the International Boundary and Water Commission, has approximated only 50% of normal since last November. During that month the total discharge was only 111,900-acre-ft; compared with a normal November discharge of 250,000 acre-ft.

Flows for December, January and February were 54%, 50% and 49% of normal, respectively.

• **Rainfall critically short**—Rainfall over much of the lower Rio Grande Valley since last November has been much lower, percentagewise, than has been the reduction in river flow. Gaging stations at four Texas cities in the lower valley—Brownsville, Weslaco, McAllen and Rio Grande City—reported only 0.81 in. for the month of November. Normal November rainfall at these four stations is 5.6 in.

During December three of the gaging stations reported no precipitation; the fourth had only 0.02 in. January also was a bad month, totaling only 1.08 in. at the four stations compared with a total normal January precipitation of 5.84 in. No records are available for February and March, but unofficial reports indicate very little precipitation.

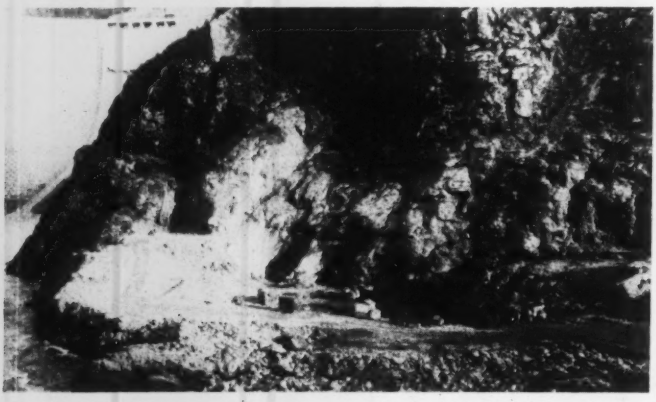
The severity of this drought serves to emphasize the necessity of the Rio Grande International Dams project, designed to assure a water supply for the lower valley in both countries.

Falcon Dam, the lowermost dam in this project, was started last year, with Mexico awarding a construction contract for $7,900,000 and the U. S. awarding contracts for $7,800,000 worth of construction and $5,000,000 worth of operating equipment. It will store 2,000,000 acre-ft. of irrigation water. Mexico already has started construction of its 575,000-acre Lower Rio Bravo irrigation system to be served by Falcon Dam.

• **Damage from freezing**—No comparison can be made between the amount of damage to crops from lack of water and that caused by freezing weather this past winter. In February, however, the 1951 Freeze Damage Committee of the USDA and Texas A&M Cooperative Extension Service reported that 20% of the fruit in the lower valley had been frozen.

Trees up to four years old were split badly, but damage to trees over five years old was limited to foliage and small twigs. These should produce some crops this year. Damage to fruit and trees, in general, was greater this winter than in the 1949 freeze.

• **Upper valley dry, too**—Irrigation water also is scarce in some areas in the upper Rio Grande Valley. Due to critically low runoff into Elephant Butte Reservoir on the river in New Mexico, no stored water could be released for winter irrigation. Unless stored reserves increase, water in the reservoir may be rationed at the rate of one-foot per acre for the coming irrigation season. Soil moisture conditions are poor. Private wells are going in and pumps installed to supplement surface water.



POWER SITE—Here, on the Skagit River, in the rugged Cascade Mountains some 90 mi northeast of Seattle, Wash., Guy & Atkinson Co. & Associates of San Francisco will build the Ross Powerhouse for Seattle City Light under a $14,688,030 contract. Ross Dam (ENR Sept. 15, 1949, p. 29) visible in the left background, will supply the water power. A delay in excavation has postponed the first electric power to early 1953.

Alcan to rent power for new $500 million plant

Aluminum Company of Canada will pay an annual "rental" based on the price of aluminum, for hydro-electric energy utilized in its proposed $500-million development, Tweedsmuir Park, central British Columbia. Hydro potential of the project is estimated at 1,500,000 hp.

That is the main feature of the agreement between the British Columbia government and the Alcan recently disclosed by Lands Minister E. T. Kenney when he laid the formal text of the agreement before the provincial legislature. House approval is considered certain.

The agreement with the government gives Alcan until June 1, 1953, to begin construction of the main works, and until Jan. 1, 1963, to get 400,000 hp in production.

By 1983 the company is to have 750,000 hp and on Dec. 1, 1999, the company will get its final license for the amount of power it is then producing.

The agreement provides for storing of 35,000,000 acre-feet and a maximum diversion of 9,500 cu ft per second. Sources of water supply are the Nechako River above Grand Canyon, tributary streams and lakes, Skins Lake and Nanika River and tributaries.

Power potential of Canada five times present rate

Canada's federal Department of Resources and Development has just issued its annual survey which concludes that only one quarter of available waterpower is being used.

Based on average stream flow, 55,000,000 hp is available to the Canadian people of which only 12,562,000 hp has been developed to date.

Greatest untapped sources of power are the mountain streams of British Columbia. Only 1,284,000 hp has been developed as against a 10,998,000 hp available in that region.

Water pollution studies aided by federal grants

The U. S. Public Health Service has started doling out almost a million dollars among the 48 states and a number of interstate groups to pay for studies related to the prevention and control of water pollution caused by industrial wastes.

The million-dollar grant is the second made under the provisions of the federal water pollution control law.

The grants, made in three broad categories include: $778,313 to the 48 states and the District of Columbia, $88,907 to seven interstate agencies for regional studies of industrial waste pollution, and $51,540 as additional grants to five states for special industrial waste pollution studies of regional or national importance.

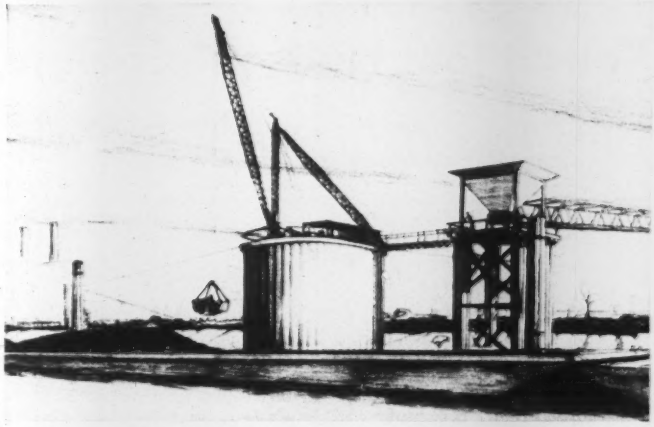
The Federal Water Pollution Act of 1948 authorized an appropriation to the Federal Security Agency (boss agency of USPHS) of one million dollars for each of the five fiscal years July 1, 1948 to June 30, 1953.

Davis Dam due to reach 643-ft elevation by May

Davis Dam reservoir is expected to reach an elevation 643 ft above sea level by mid-May. At that time Lake Mohave will have backed up to the Hoover power plant tailrace in Black Canyon, a distance of 67 miles. It will contain 1,700,000 acre ft.

Once the high elevation has been reached it is expected that only small fluctuations will occur during the months following. It will have taken a year to reach the new level.

Water is now flowing over the completed Davis Dam spillway and is also being released through the first of the Davis power plant's five 45,000 kw generating units. Power plant turbines may be in operation this summer.



DESIGNED FOR HIGH WATER—Under construction at Venice, Ill., is this coal-handling installation which is engineered to be safe against shut-downs due to high water in the Mississippi River. The unloading derrick and barge pullers will be set on top of a 30-ft dia steel sheetpile cell, and the hopper for the conveyor that will deliver coal to the stockpile will be supported above highwater level. The installation was designed by Union Electric Power Co. and Vollmar Bros. Construction Co., both of St. Louis, Mo. Cost, $200,000.

Pollution plagues Tenn. watershed

Pollution has seriously degraded many surface waters which are valuable as industrial water supplies in the Tennessee River watershed, the U. S. Public Health Service asserts in a report issued last week.

The report is the first of 14 comprehensive surveys dealing with major watersheds of the nation to be issued by the federal agency under authority of the Federal Water Pollution Control Act and in cooperation with the various states. (ENR Feb. 22, p. 31).

Sewage and waste treatment projects estimated to cost upwards of $57,000,000 are needed at 227 municipal and industrial locations in the Tennessee Valley to bring water pollution under proper control. This is the major recommendation.

According to the report, initial cost of required municipal treatment plants will be about $15,400,000. This estimate covers those municipalities where revisions to existing plants are required and includes treatment of industrial waste now connected with municipal sewerage systems. The cost of interceptors is estimated at about $26,300,000.

Industrial waste treatment, exclusive of industrial waste now discharged to municipal sewerage systems, would cost between $5,000,000 and $10,000,000.

• **Attention, but few results**—The report points out that although little has been done in the way of pollution abatement construction since the war, both municipalities and industries have continued to give their attention to the problem.

There are said to be 201 sources of municipal pollution and 148 sources of industrial pollution in the water basin. The major pollution load, the report shows, originates in the upper portion of the basin, above Chattanooga.

Industrial wastes—from pulp, paper and textile mills—account for at least two-thirds of the total pollution of an organic nature while chemical plants are said to be the major contributors of inorganic wastes, such as chemical-acids, metals and toxic materials.

N. C. passes pollution abatement law

Clean-streams legislation has finally made the grade in North Carolina after failing enactment in each biennial session since 1945.

As amended prior to passage, the successful stream sanitation bill sets up an eight-man committee under the State Board of Health. Originally, it would have been independent.

Other last minute changes that went through as the legislation shaped up included addition of one more municipal representative to the sanitation committee—to bring the total to eight: one from agriculture, one conservationist, two from industry, two from municipalities and two ex-officio members.

The chief engineer of the state Water Resources Commission and chief sanitary engineer of the Board of Health are the two ex-officio members; neither has a vote under the act.

• **Stream classification**—Each body of water in the state will be classified according to present use and flow. Any new discharge of waste, treated or otherwise, will require permit from the new control agency.

No curb would be put on existing discharge of wastes if its correction were proved "not feasible."

Tough job: Hudson pipeline crossing

Robert H. Dodds
Associate Editor

THE LAST MILE was the toughest for the 1,840-mile Texas-New York gas pipeline. That mile took the line across the Hudson River.

As finally performed, the job was difficult enough. But it also suffered a spectacular bit of hard luck—the failure of an original and daring construction scheme.

Omaha Dredge & Dock Co. was the contractor. Fish Constructors, Inc., Houston, Tex. was contract-awarding agency for Transcontinental Gas Pipe Line Co., also of Houston.

The assignment was to run a 26-in. pipe with super-thick 1⅛-in. walls from a valve station at the foot of the Palisades in Edgewater, N. J., 4,650 ft to a valve-station pier just outside the bulkhead line of Manhattan Island's upper west shore. The pipe was to go 25 ft beneath river bottom, which ranged up to 67 ft in depth.

• **Loose bottom needed**—Omaha had an idea: If the Hudson's mud were pervious enough to be liquidized readily, it would be possible to settle the pipe into position by jetting.

An independent engineering report opined that the mud was sufficiently loose and permeable, so the jet-settling idea was adopted.

The idea, detailed below, stumbled over at least one fact: River bottom material was too hard.

• **About face**—So the jet method, together with a large amount of jetting equipment, had to be set aside in favor of a more conventional approach.

Omaha set Morris & Cummings, New York dredging contractors, to excavating a 25-ft-deep box-cut trench on pipe location, and prepared a pipe-launching yard ashore at the pipe's Edgewater end. Now it was to be plain, unglamorous hard work.

The dredge, a 17-yd clamshell rig, took out 220,000 cu yd.

Meanwhile, at Edgewater, workmen laid a launching track in line with the pipe's river location. And outshore they drove piles for a gallows frame that would act as a clamp for already-launched pipe when it was being welded to an unlaunched section. Cables from a two-drum hoist on the frame would maintain vertical and lateral pipe positions.

Preparations on the New York side were simple: Two single-drum gasoline winches with 70,000-lb line pull each were deadmanned on shore.

(Another contractor had built a valve-house pier outside the Manhattan bulkhead line. This was to be the point of delivery to New York gas companies.)

The New York hoists would pull the pipe through the latter three-fourths of its installation. The first one-fourth would be "pushed" by a hoist on the Jersey side. That hoist, a 140-hp torque-converter rig, was deadmanned alongside the launching track, its line reeved through a block on a shoreline pile cluster, then moved the barge to the center of the river, where a winch on the barge was to take over linear movement by pulling on a line deadmanned on the shore. (Tugs would counteract transverse tidal action.)

Here's where the idea stuck in the mud. Pumps and compressors went to work. The spud went down, nosing 25 ft into the bottom. It nosed all right, but winch-pull threatened to overturn the spud. The bottom was harder than anticipated; free lateral motion just wasn't obtainable because the expected infusion and consequent softening of surrounding material didn't take place. Moreover, the material being cut resembled a hard clay more than it did soft organic silt, which had been described in the engineer's report.

• **Pipe jets**—Meanwhile, on a level space between palisades and river a quarter mile upstream from the pipe's location, Omaha welded pipe lengths into nine 440-ft sections, and began to get pipe-jetting equipment in order.

Twenty-foot lengths came on the job already coated with ¾-in. of a tough sand-asphalt compound. After men hand-placed stringer beads, an automatic welding machine finished joints at the rate of 3 to 7 per day.

The Idea That Stuck in the Mud

Here's how Omaha Dredge & Dock Co. planned to lay the Hudson River pipeline:

A barge-mounted spud-jet, or hydraulic plow, was to make a 25-ft furrow in the river bottom, preparing for the pipe and probing for obstructions.

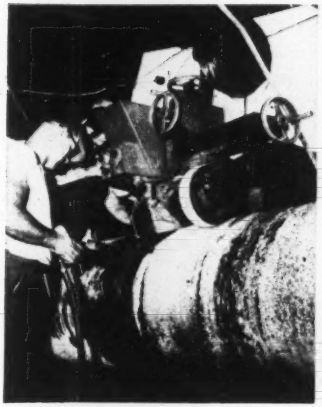
Multiple jets on the bottom of the pipe were to settle the pipe into the furrow.

• **The hydraulic plow**—The barge was an old 256-ft freight-car float. Omaha cut a well in the barge, then mounted four 8-in. 3,000-gpm pumps, a 500-cfm compressor and a guyed boom with 3-drum hoist on the deck. These items served and handled the spud-jet, which was a 115-ft length of 24-in. pipe. The pipe's upper 90 ft was open, containing hoses and pipes connecting pumps and compressors with the lower 25 ft. The lower 25 ft, which was to do the actual plowing and bottom-probing, was closed by four diaphrams that formed three 8¼-ft deep pressure chambers. Each chamber was served by a 4-in. pressure pipe. Each chamber wall had ten 1¼-in. holes to direct air and water horizontally. (And thereby soften the river-bottom mud by infusion.)

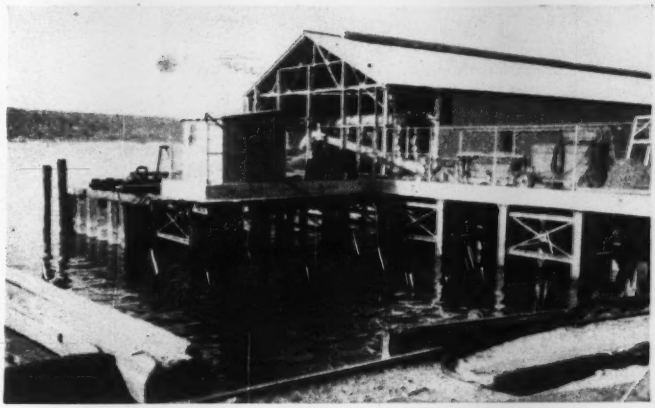
In addition, there were three 4-in. jet pipes: one, passing through the chambers to the bottom, pointed downward; the other two, mounted outside the spud, directed 3,000 gpm of water 30 deg and 60 deg above horizontal, from bottom of spud.

When the rig was ready, the hoist's lines raised the spud, threaded it down through its well. Tugs then

SPUD-JET—Calibrated for easy elevation control, the pipe alongside the guyed boom works through a well in barge. Jets in lower end were supposed to soften river bottom, probe for obstructions.



HUDSON GAS PIPE—Workman chips fresh weld as 26-in. pipe with 1¼-in. walls slowly rotates in automatic welding machine. (Wide World Photo)



THE GOAL—Valve house for delivery of Texas gas was built on a pier outside New York bulkhead line, to avoid transmission-company invasion of New York gas company's franchise. Pipe comes up out of river bottom and ties in at sheetpile cofferdam (left). (ENR staff photo)

through a block on the rear end of the pipe to be pushed. The line was dead-ended to another waterline pile cluster on the other side of the pipe.

• **Launching**—Only 300 ft was available for launching tracks, so sections previously welded to 440 ft length (in the original welding yard) had to be cut down before they were loaded on barge pairs and brought the short distance downstream to the new yard.

To put a pipe section in the launching yard, a work boat beached the inshore barge at the track-end and men put a track dolly under the section's projecting end. A floating crane lifted the pipe for removal of the first barge and a side boom tractor ashore walked the section slowly onto the track. When the second barge reached

Banding-on 1x2-in. wood slats was the actual final operation on pipe at this upstream yard.

Further operation on the pipe sections would have included attaching jets. The jets were in the yard already, as were their connections and 20 8-in. jet pumps, each powered by two 225-hp diesel engines in direct drive on each end of pump shaft.

Each jet orifice was a flattened section of 4-in. tubing welded to a 4-in. manifold pipe so as to direct a flattened jet stream about 15 deg off the manifold's axis.

Each 20-ft section of manifold had five jets, at 4-ft spacing.

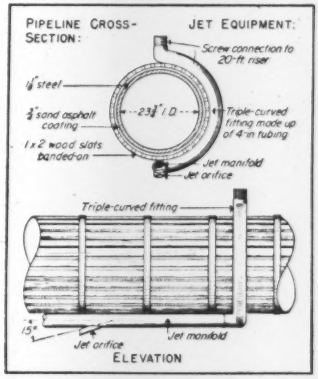
The manifold was to lie under the pipeline, with orifices on the bottom. Feed for each manifold was to come through a triple-curved 4-in. fitting that went up around half the pipeline, then hooked up, to accommodate (by screw connection) a 20-ft length of 4-in. pipe. Connection between pipe and jet pump would be by hose.

• **To set the pipeline**—Installation plans called for a two-stage operation, covering about half of the river width in each stage.

First, five of the nine 440-ft sections would be joined on a string of scows and barges along shore. Jetting pipes would be attached to the line. The mechanical equipment would be mounted on the scows and barges.

The line would be plugged at both ends, then suspended overboard (immersed to reduce weight from 350 lb per ft to 100 lb per ft).

Next, after jetting equipment was hooked up, the pipe and string of



SETTLING JET—Flat streams of water and air were supposed to undermine the pipeline, allowing it to settle into mud. Omaha had about 200 manifold assemblies on job.

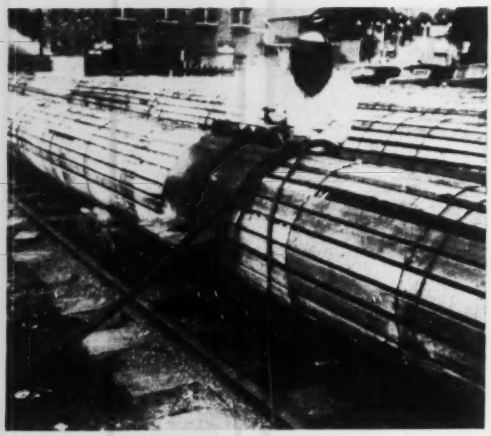
barges would be swung outshore and jockeyed to centerline position, where the pipeline would be lowered to the bottom. An above-water connection would be made at the New Jersey shoreline, then the pumps and compressors would go to work to settle the line the specified 25 ft beneath the river bed.

Except for some sort of pick-up arrangement at the midstream end, all connection with the settled pipe then would be severed by unscrewing jet-pipe risers where they joined the triple-curved fitting. Fittings and manifolds were to be abandoned on the river bottom.

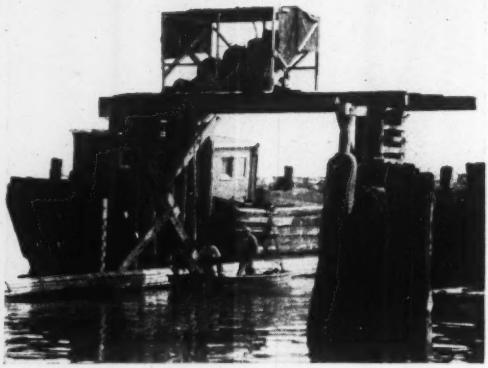
The second stage was to be conducted similarly to the first, the principal difference lying in the midstream closure. The previously-installed end would be raised for an above-water connection, flexibility of the pipeline being sufficient to accommodate the pick-up.

None of the installation procedure outlined above ever took place. The whole jet settling scheme hung up when the first step—spud jetting—failed.

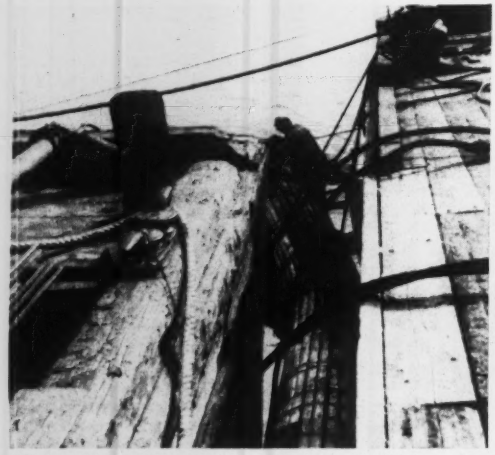
(Louis I. Pentzien, Omaha's general manager, says that subsequently the scheme and some of the equipment have been used successfully on a water-crossing job in Louisiana.)



LIFTING LOOPS—Welder in launching yard attaches cables for emergency use in case pipe has to be raised from river bottom. This pipe section is on launching track (ENR).



GALLOWS FRAME—Lines from hoist rigidly positioned already-launched pipe for welding line-up with section to be launched next. (ENR)



PIPE'S HEAD END—Vertical bends for quick rise from deep channel on New York side were fabricated between barges in a horizontal plane, swung to vertical for the tow. (ENR photo)

MISHAP—When tow started, tide made barges holding up the head end drag their anchors, pulling pipe off line. Here's the unexpected bend, after replacement. (Charles Arnold photo)

shore the crane picked up the pipe while the barge was removed.

Once ashore, the section was rolled laterally off the dolly onto yard skids, where it reposed until its turn came for welding and launching as a part of the completed pipe. Two short sections were not landed. These were to be made up, over water, with three shop bends to form a zigzag assembly at the pipe's head (New York) end. This zigzag would bring the pipe up out of deep water, take it along an old pier, then point it upward at an angle toward the valve-pier cofferdam, for tie-in. (A final diagonal section, for closing, would be attached when the pipe reached the New York shore.)

Other bottom profile changes were gradual, so pipe would bend to conform, merely by its own dead weight.

The three bends with their adjoining straight sections were welded together in a horizontal plane just above water, while suspended between pairs of barges.

Before pipeline installation began, one precaution was taken: Cable loops were attached at points that would be about 500 ft apart when the pipe was in place. These would make possible lifting the pipe in an emergency.

• **The tow**—When the bend assembly was complete, it was secured in the gallows frame and welded to the first straight section, which still rested on launching-track dollies.

The pipe was rotated 90 degrees to bring bends into a vertical plane and sink them. Then a pair of barges that had supported bend work was turned transverse to the pipe. This pair would hold bend assembly so that its rear (sag) bend was in the ditch throughout the tow across the river. The rest of the pipe was dragged.

The transverse barge position (parallel with the shore) also presented less area to 3.4-knot tide stresses. The principal steadying force against tides, however, was a set of four 1600-lb anchors for each barge. These anchors were connected to barge-deck winches, which controlled barge position by give and take on anchor lines. Tugs

and derricks ran anchors to new locations when necessary. At last the real towing job was ready to go.

• **More bad luck**—Anchors were set; the pusher hoist was rigged up.

The drum began the move—to shove the first 300-ft straight section out through the gallows frame and into the river.

Then once again bad luck struck. Near the end of the first shove the tide became too much for the 1600-lb anchors. They dragged.

And the massive pipe bent at the gallows frame, as easily as a piece of electrical conduit does in a hickey.

Anchors weighing 3,400 lb apiece corrected the drag situation. After the bend was cut out (a week was lost), welders put in a new section and the shove proceeded—in twice-a-day 300-ft increments.

Actual launching took about an hour per increment. Preparation for the next increment (rolling a new section onto track dollies, welding it to the already-launched portion, coating and slatting the new joint) took four to six hours. Hence two launchings ran the job into a second shift daily.

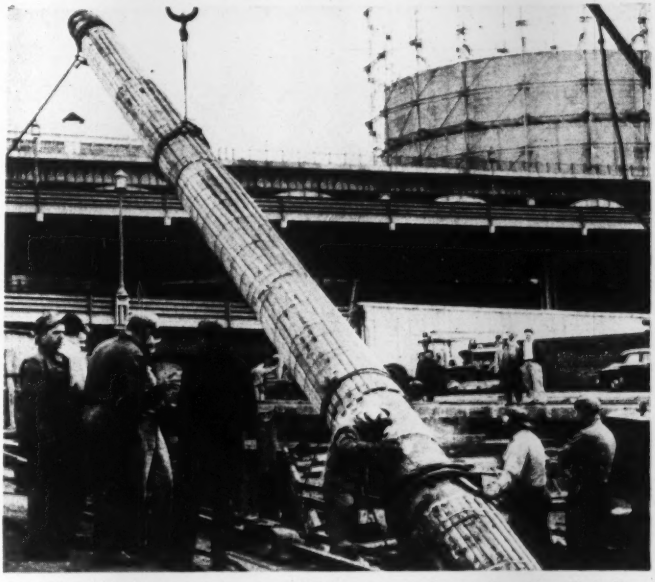
When the pipe reached 1100 ft outshore from Edgewater, divers hooked the two Manhattan lines to the head end. Now there were three hoisting engines working the pipe. Need for all three increased as the line approached New York, because it took an increasingly healthy push-pull to break the initial adhesion between pipe and mud (the last pull almost stalled the New York hoists). Once adhesion broke, one engine did the job.

Coordinating hoists on two sides of the river called for that modern device, the walkie-talkie. A supervisor standing beside the Jersey winch radioed the signals to another supervisor on the New York winches. The tow proceeded in short bites, interrupted by pauses to remove track dollies. Two side-boom tractors handled pipe and dollies at the river's edge. A floating derrick fairleaded the pulling lines at the New York end.

When the pipeline tow was complete, engineers measured the gap between the last bend and the cofferdam, cut a length of pipe to fit. One floating derrick raised the head end out of the water while another derrick handled the 60-ft closing section. When a watertight plug was removed from the head end, the final piece was lined up and welded on. Together the derricks lowered the line to its final resting place.

Meanwhile, on the other side of the river, welders completed the tie-in, the line's short section, already in place at a grade slightly above low water.

WALKIE-TALKIES coordinated pushing winch on Jersey shore with pulling winches on New York shore. Foreman signals "hold" as a morning tow is completed. (ENR)



ALMOST FINISHED—Workmen weld 60-ft section on head end at New York shore. Next, pipe will be lowered for tie-in at valve-pier cofferdam. (Wide World Photo)

All that remained of the Omaha contract was the pressure test. Soon natural gas from the Rio Grande Valley would be serving New York. A distribution system already was complete (ENR Sept 14, p 41).

• **Management**—The Hudson River pipeline job was managed by Louis I. Pentzien and Joseph G. McMaken, of Omaha Dredge & Dock Co. Ray Henry was superintendent and Clarence Zarn was project engineer. Resident engineer for Fish Constructors, Inc. were H. G. Phelps and Loren Nelson. E. M. Lemke was in charge of engineering and construction, under Frank Chilson, chief engineer of Fish.

In addition to Morris and Cummings, Schultz Dredging Co., Hoboken, N. J., did dredging on the job. The latter removed a section of coarse material near the Manhattan shore.

Raymond Concrete Pile Co. built the valve-station pier.

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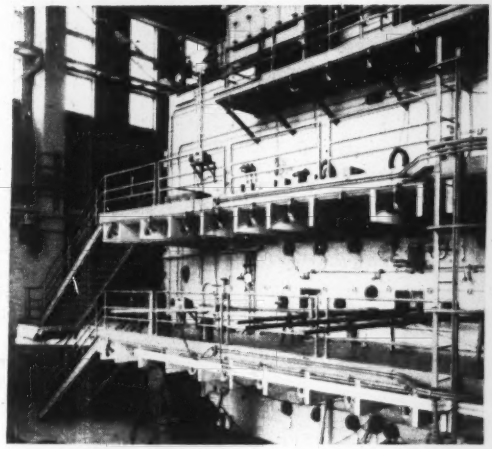
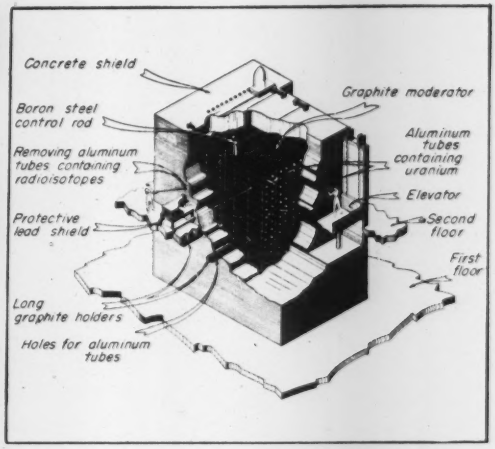




NUCLEAR REACTOR at Brookhaven, L. I., consists of uranium, a pile of graphite blocks and a thick concrete and steel shield.

Building a large atomic pile by contract

CONSTRUCTION of the atomic pile at Brookhaven National Laboratory, Upton, N. Y., was a challenging undertaking.

Among the complex problems the contractor had to solve was the handling and machining of radioactive material; precision machining of 60,000 graphite blocks, which had to be piled up without bonding material; installation of an extensive cooling system; erection of radiation shields made of steel plate up to 18 in. thick. Some intriguing foundation problems also were licked. And throughout the job, strict security was maintained.

The Brookhaven pile is the first nuclear reactor ever built exclusively for research. It is the most versatile and possesses the greatest concentration of insfrumentation ever installed in an atomic pile. It can operate at any level up to its 30,000-kw capacity and will allow many different nuclear experiments to proceed simultaneously, each under the most carefully controlled conditions.

• **What a reactor does**—Brookhaven's reactor is a giant cube, or pile, of graphite into which uranium is inserted in an exact pattern. Its primary purpose is to produce neutrons for experiments. Neutrons are particles contained in the nucleus of an atom; they are separated from it by bombardment with other neutrons. In a reactor, this splitting of the nucleus becomes a chain reaction, in which neutrons cause uranium nuclei to split, thereby releasing more neutrons, which in turn split more uranium nuclei, producing still more neutrons.

Thus, a pile in operation becomes a vast reservoir of neutrons and a source of fission products—radioactive substances into which uranium nuclei are split. The dense concentration of neutrons inside the reactor gives scientists ample opportunity to gain further knowledge of the neutrons themselves and of substances exposed to them. Neutrons will be utilized at Brookhaven by inserting materials into the reactor, or by allowing beams of neutrons to emerge under controlled conditions through holes in the shield surrounding the reactor.

Most chemical elements, when inserted in the reactor and bombarded by neutrons, emerge radioactive (able to send off rays or particles). Known as radioisotopes, they are used by physicists and chemists to study the fundamental nature of matter.

Many radioisotopes decay by emission of rays or particles in short times (minutes, seconds or less) and thus require study close to the reactor. For this reason, Brookhaven's reactor has pneumatic tubes that whisk samples to be studied into the reactor and out to adjacent laboratories in a few seconds. Other radioisotopes, which exist for longer periods, will also be studied. They serve as important research tools in biology, medicine, agriculture and engineering.

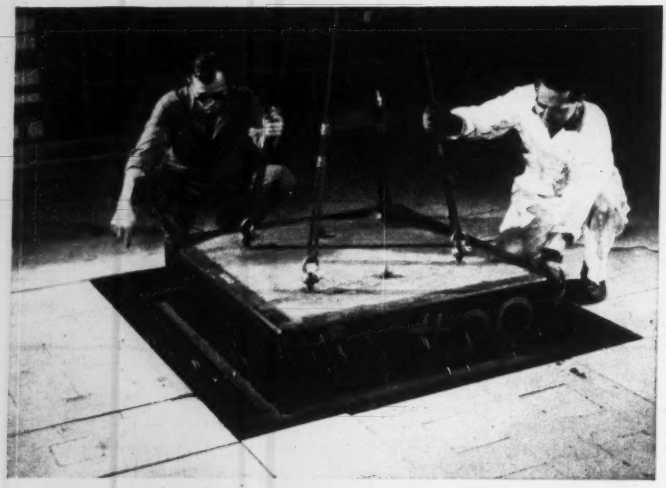
Other types of experiments make use of the neutrons within the pile, or beams of neutrons emerging through openings in the shield wall. Metallurgists interested in the design of future reactors, which can be used for submarine power plants, plutonium production or commercial power, will study the changes in structural properties of materials exposed inside the reactor. Biologists will study changes in plants and animals exposed to radiations from the reactor.

• **Main elements**—The Brookhaven atomic pile consists essentially of five elements: Moderator (graphite), fuel (uranium), control system, shield (concrete and steel), and cooling system.

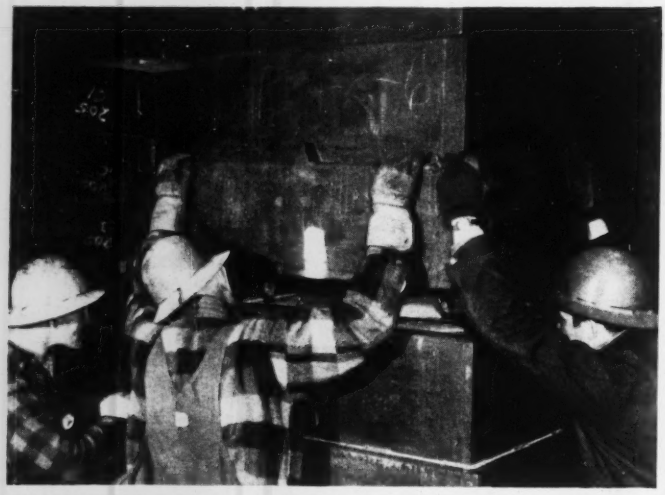
Uranium fuel encased in aluminum cartridges is pushed into one of the many openings in the loading face of the reactor. (Aluminum casings are used because this metal withstands high temperatures and is only a slight barrier to the neutrons.) Inside the reactor is a huge cube of graphite. Called a moderator, the graphite cube slows down the neutrons generated by the chain reaction to a speed at which they are most likely to cause fission of nuclei.

Operations of the reactor are controlled from a room equipped for continuous recording of the power level, neutron concentration and other essential data. Control rods containing boron serve as blotters in the reactor to soak up neutrons vital to the chain reaction. These rods are inserted or removed by delicate remote-control mechanisms, so that operation is flexible up to maximum power.

To protect personnel from radiation, the pile is surrounded by a shield of concrete and steel several feet thick. Routine precautions for protection of



STEEL-PLATED CONCRETE BLOCKS form a removable part of the atomic-pile shield. A 10-ton crane lifts them out of the way to provide access for servicing.



REMOVABLE BLOCKS, lowered into place, overlap each other slightly to prevent escape of radiation. Steel plate in the shield is up to 18 in. thick.

operating personnel include heavy lead shielding, instruments for monitoring radiation levels whenever radioactive material is handled and use of periscopes and remote controls to manipulate highly contaminated substances.

There are five major structures in the Brookhaven project, largest of which is the reactor building. Two laboratory wings with a total of 30,000 sq ft of floor area, are located on either side of the reactor building, and a "hot" laboratory nearby provides 33,000 sq ft of floor area for research with high-intensity radioactive materials. Also nearby is a fan house and a boiler house for heating and process steam. These buildings cost about $25,000,000 to construct.

Ground was broken for the reactor on Aug. 11, 1947. Operation of the pile started Aug. 22, 1950.

• **60,000 pieces of graphite**—The unusual nature of the engineering and construction program, which were carried out at Brookhaven by The H. K. Ferguson Co., is indicated by the work that went into the giant cube of graphite, where the atomic reaction actually takes place. The cube is composed of 60,000 pieces of graphite, stacked one atop another like building blocks. There are 2,600 different sizes and shapes in this pile, so that an individual drawing had to be prepared by Ferguson's engineering department for each of the 2,600 variations.

Machining of graphite to tolerances of a few thousandths of an inch was unusual in that it was the responsibility of the builder, rather than of an outside supplier. For security and other reasons, this work had to be done on the job site. It was accomplished by a subcontractor—Liberty Products Co. of Farmingdale, L. I.—in a former Army gymnasium at Brookhaven, which once was part of Camp Upton. The gymnasium was equipped with a complex dust-collecting system to remove graphite dust and provide safe working conditions.

Ferguson's own forces stacked the graphite blocks in the pile. No bonding material was permitted between individual blocks of graphite; hence, a highly complicated keying system, in which every piece is keyed either once or twice, was used. Lack of a bonding agent, which would have made the nuclear process unworkable, accounts in part for the close tolerances specified—necessary so that the parts of the structure stay together.

Both external and internal forces had to be compensated for in the design of the blocks. External forces are large, due to the pressure drop required to provide a big volume of cooling air. Internal forces arise from temperature differentials inside the graphite cube during the atomic reaction.

Stacking of the blocks (some of which were 4 ft long and weighed 50 lb) had to be done under conditions regarded as extraordinary in the construction industry. It was necessary, for example, to prevent contamination of graphite. Principal agent guarded against was borax, an ingredient of most laundry soaps. Therefore, personnel stacking graphite were provided each day with a pair of white coveralls and gloves laundered with borax-free soap. They were also furnished basketball shoes to prevent slipping. Gloves were changed about six times daily to avoid accidents likely to result from accumulations of slippery graphite dust from the graphite blocks.

• **Machining of uranium**—Problems similar to those encountered in fabricating graphite blocks were met in the machining of uranium. This difficult task was the responsibility of the builder. It was performed under sub-

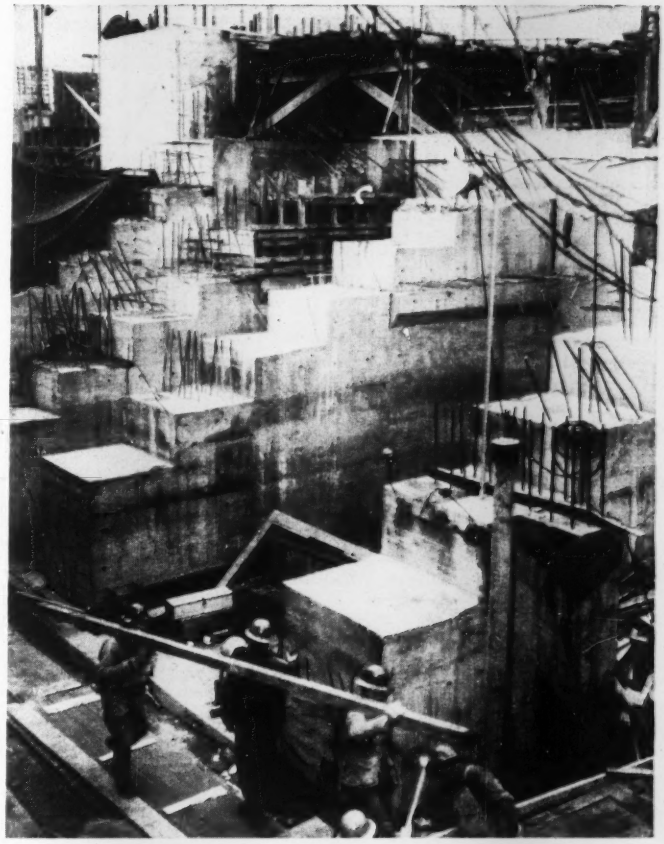
contract by Chapman Valve Co. of Indian Orchard, Mass.

Security provisions for the handling of uranium are probably the strictest of all. The metal was brought to the site under armed guard, and the smallest fraction of the material had to be accounted for. Chips and grindings were always under the most careful control.

Uranium is hazardous as well as valuable and must be handled with extreme care to protect the health of workers. It is so chemically active that it will burn under water. Finely-divided particles will ignite at room temperature. It is poisonous and of course, radioactive. It is also extremely abrasive, wearing out cutting tools and inspection equipment very rapidly. Furthermore, it is a heavy metal (1,150 to 1,200 lb per cu ft.) and somewhat plastic.

Machining and storage, therefore, were planned to involve as little handling as possible. Special cutting compounds were used to keep uranium below the igniting point while being processed. Machining equipment was provided with hoods and exhaust ventilation to protect operators. And contaminated equipment had to be thoroughly cleaned or disposed of.

Despite the many difficulties involved, uranium was machined efficiently and to a high degree of finish. Success of the operation, however, required the utmost care and a strict observance of Atomic Energy Commission regulations down to the smallest detail.



CONCRETE BUTTRESSES help distribute the tremendous weight of the atomic pile over the foundation, which rests on sand 35 ft below ground level.

• Heavy plate for shielding—The pile shield, which encases the graphite cube on all sides to protect personnel from radiation, provided one of the most interesting structural aspects of the project. The shield is constructed of concrete, several feet thick, and steel plate ranging in thickness from 9 to 18 in.

Concrete was made with admixtures that improve its shielding properties. The steel plate serves structurally as well as protectively and is said to be one of the largest concentrations of armor plate ever used on a land-based building project for non-military purposes. Its usual use is as armor plate in naval construction.

The heavy plate was obtained from surplus in the Panama Canal Zone. New material was generally unavailable on the market at the time required and would have cost a lot more money.

The plate was fabricated by the New York Naval Shipyard in sections weighing about 10 tons each. To facilitate erection on the job site, the builders scheduled their work so as to have the pile's permanent 10-ton traveling crane in operation when steel plate was ready to go into place.

Many of the plate sections are pierced by holes for control equipment, slots for uranium charges and openings for experiments. Special plugs were made to be inserted when the openings are not in use, and tolerances for these plugs were relatively close.

Sections were stacked one atop another to form wall shielding, and side by side in the base and top. They were electric-welded in place.

• Large Cooling System—To remove the heat (equivalent to 30,000 kw of power) generated within the pile during the fission process, a huge cooling system is required. In the fan house adjacent to the reactor building, centrifugal compressors draw 300,000 cfm of air through the pile cooling system. Air speeds vary from 40 mph in the main ducts, two of which are large enough to accommodate a New York subway train, to hundreds of miles per hour in the small graphite passageways. Five blowers are each driven by a 1,500-hp motor at a speed of 3,600 rpm.

The method followed in the design of the fans is typical of the procedure carried out by Ferguson engineers in other installed-equipment phases of the project, such as instrumentation. Every effort was made to adapt existing industrial equipment; conventional items of equipment were used with modifications, and the background of experience in manufacturing and operating this equipment could be fully utilized. Designing special equipment was avoided wherever possible, thus keeping costs down.

In the case of the fans, B. F. Sturtevant Division of Westinghouse Electric Corp. worked closely with Ferguson to adapt one of their models. This fan installation is one of the largest

in which a very high pressure ratio is achieved in a one-stage installation of air coolers on the suction side of the fans. The design enabled the temperature and volume of air to be kept relatively low, with a resulting reduction in equipment size.

Air is filtered before and after it leaves the pile. Dust is taken out before air goes into the pile, and any dust that may have been picked up inside the pile is removed before the air is expelled. The air is finally exhausted through a 320-ft high reinforced concrete stack. A silencer of unique design was built into the ducts and the base of the stack to eliminate noise. Alphons Custodis Chimney Const. Co., built the stack.

A secondary cooling system also was installed. It was necessary because temperatures of exhaust gases from the pile are higher than temperatures concrete can stand continuously. The secondary cooling system was therefore developed to prevent impairment of strength and life of concrete in the duct system.

Refrigeration was required for air conditioning the pile building and control areas, the pile laboratory and an adjacent "hot" laboratory where radioactive materials are handled. Low humidity is required in these buildings for process control of ambient conditions. A 500-ton system was installed. Air conditioning is provided only in laboratory working areas that require maintenance of uniform temperature and humidity conditions for operation of delicate instruments and control of experiments.

• Foundation carries heavy load—Foundation problems are especially interesting for two reasons. First, the nature of the atomic pile and the method of assembling graphite required prediction of settlement of the foundation, which rests on sand, within very close tolerances. Second, the weight of the atomic pile—about 40,000,000 lb, including the foundation—produces a soil pressure of 6,500 psf directly under the footing. Also, the structure had to be designed to withstand earthquakes.

The foundation consists of a concrete base, on which the graphite blocks rest, and a concrete mat, which is 5 ft 9 in. thick directly under the pile, 3 ft 9 in. elsewhere. Heavy concrete buttresses help distribute the load to the mat.

Total settlement, as well as differential settlement, or tilting, had to be predicted and compensated for in advance. Prior to the start of detailed design, borings and load tests were made to determine the elastic properties and load-settlement characteristics of the subgrade. (The foundation extends 35 ft below the ground surface.) Predicted total settlement was 2 in.; actual settlement was 1¼ in. This was compensated for at the top of the foundation by correcting for tilting and by building the pile base higher by the amount of the additional settlement to be expected.

Since the foundation rested on sand, there was no plastic flow of the soil to contend with.

• How security affected the job—Maintenance of strict security throughout the duration of the work influenced organization and planning considerably. Ultimately, every employee was investigated by the Federal Bureau of Investigation, a process that took up to three months per man.

The labor force was divided into two groups: one consisting of employees whose clearance was established, the other employees whose clearance was pending. The project itself was in turn divided into classified (restricted) and unclassified areas, all of which were sealed off—some by temporary walls—and protected by armed guards who examined credentials of all who entered. Employees whose clearance was pending could work only in unclassified areas. As clearances came through, employees were issued new badge and put in classified work.

This procedure made it necessary to anticipate labor requirements about three months in advance, to assure a supply of cleared men for classified work. Security investigations could not begin until a man was on the payroll, and this sometimes made scheduling of the two types of work (classified and unclassified) an involved problem.

Two factors had to be borne in mind: First, that there must always be a sufficient supply of cleared workers for assignment to classified work; secondly, that men had to be kept productively busy on unclassified portions of the project while clearance was pending. Peak employment reached 2,000, and there was never a shortage of cleared personnel in any of the 19 trades and crafts represented.

Security also affected the handling of materials. For example, because of the type of concrete used in the pile shield, the contents of which are classified, it was necessary to set up two separate batch plants to furnish the 29,000 cu yd of concrete required. One batch plant was operated on a conventional basis. The other was operated under security conditions. Even overages and wastes from the classified plant were destroyed under security regulations.

A similar procedure was used in the handling and storage of other materials. One warehousing operation was classified, the other unclassified.

• Safety saves money—An organized safety program was maintained throughout the job. One result was that more than $300,000 was saved in insurance costs. This saving represents money returned to the government under the terms of the insurance contract covering the project. There was not a single fatality or serious accident in the three years required to build the pile—representing 5,684,693 man hours worked.

During 1948, a typical year of the three-year program, Ferguson forces at Brookhaven suffered only 21 accidents involving loss of time. The accident frequency rate was 6.89 disabling injuries per million man hours worked, while the national average for general building construction for the same period was 31.99—almost five times greater. The 1948 severity rate at Brookhaven was also much lower than the national average—0.08 days lost per thousand man hours compared with the national rate of 2.09. Ferguson trucks on the project had the lowest accident rate in the country for vehicles of their class during the period June 30, 1947, to June 30, 1948. The company's buses had the lowest national rate in their class, and passenger cars the fifth lowest rate.

During the course of the entire job, there were a total of only 40 lost-time injuries, accounting for a loss of 792 man-days. The frequency rate for the job was 7.04 disabling injuries per million man hours, and the severity rate was 0.14 days lost per thousand man hours.

This record was accomplished with an enforced safety program that involved planning of safe construction methods in advance of actual operations; regular field safety inspections; use of safety equipment, and a safety incentive system among crafts.

• Participants—Engineering design and construction of the Brookhaven reactor were carried out by The H. K. Ferguson Co. of Cleveland and New York under supervision of Wells N. Thompson, vice president. Scientific specifications were established by the Brookhaven reactor staff, headed by Lyle B. Borst. The contract under which Brookhaven operates is supervised by Wilbur E. Kelley, manager of the New York Operations Office of the Atomic Energy Commission, and E. L. Van Horn, manager of AEC's Brookhaven area.

Babcock and Wilcox Co. of Barberton, Ohio, served as engineering consultant in the final construction stages, along with David Rossheim and Addison G. Bissell, special consultants to the AEC. Prof. D. M. Burmister of Columbia University was consultant on the foundations.

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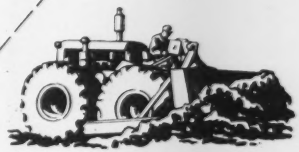
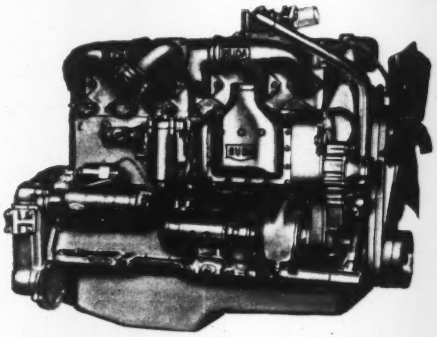


DOZERS

WAGONS



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A vacuum-flotation unit (ENR Oct. 19, 1950, p. 46), included in the de-

SIX-DAY OPERATING-TEST DATA

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Day		Flow mgd	pH	VF Unit Overflow Rate (G/sq ft/day)	Suspended Solids (ppm) Sta 1	Sta 2	% Red	Sta 3	Sta 4	Sta 5	% Red	Settleable Solids (% Volume) Sta 1	Sta 2	% Red	Sta 3	Sta 4	Sta 5	% Red	Dissolved Oxygen (ppm) Sta 1	Sta 2	Sta 3	Sta 4	Sta 5	BOD (ppm) Sta 1	Sta 2	% Red	Sta 3	Sta 4	Sta 5	% Red
Sun	Max hr.	.87	I 7.3	4,000																									
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Mon	Max	.95	I 7.4																										
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	Min	.21	E 7.6																										
Tues	Maxs	.96	I 7.2																										
	Avg	.63		5,350	146	81	44.5	114	49	15	90	.30	.05	83	.16	.02	Neg.	99+	0	0	2.1	1.4	5.2	101	86	15	26	14	8	92
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Wed	Max	.99	I 7.3																										
	Avg	.56		4,750	156	97	38	86	29	8	95	.40	.12	70	.25	.05	Neg.	99+	0	0	1.7	1.4	4.8	176	122	30.8	40	28	7	96
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	Avg	.55		4,660	303	150	50	150	55	18	94	.65	.15	77	.25	.01	Neg.	99+	0	0	2.0	1.7	5.1	170	115	31.4	56	30	12	93
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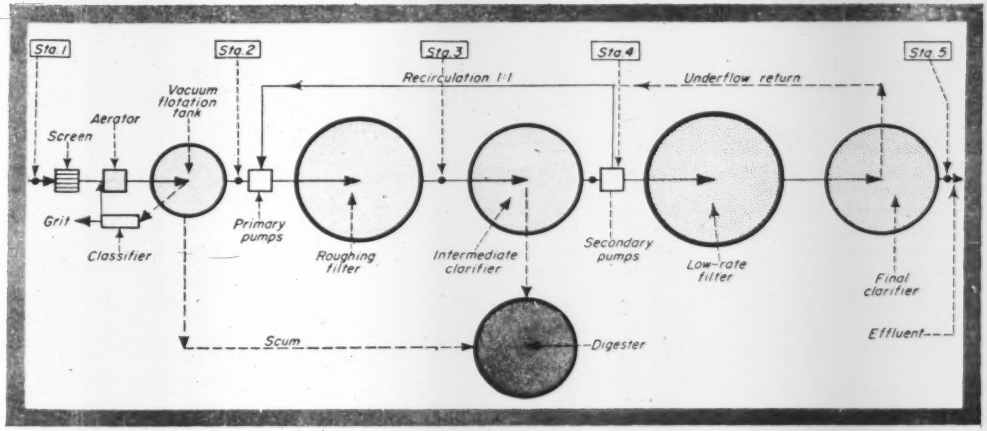
	Avg	.56		4,750	220	105	52	97	48	16	93	.45	.25	45	.30	.07	0.02	96	0	0	2.3	0.5	4.4	197	156	20.8	60	35	14	93
	Min	.39	E 7.4																										
Aver. Values	Max	.94	I 7.30																										
	Avg	.56		4,750	195	104	46.6	109	47	15	92.3	.47	.17	64	.25	.03	Neg.	99+	0	0	2.1	1.5	5.0	162	116	28.4	49	28	11	93
	Min	.33	E 7.55																										

I—influent; E—effluent; Red—reduction. REMARKS: Sat—Rain; Sun—Clear; Mon—Heavy rain Monday night; Tues—Clear; Wed—Clear; Thurs—Supernatant discharged, also wet weather; Fri—Clear day, showers at night.



TREATMENT is by vacuum flotation, roughing filtration, intermediate clarification, low-rate filtration and final clarification. Digested sludge is dried on sand beds, conveyed to trucks and sold to farmers as fertilizer.

sign to intercept troublesome floating material, showed an average BOD removal of 28%. It was specified to give a 20% reduction.

The tests were intended to verify vacuum-flotation effectiveness but they were extended to the whole plant.

• **Processing the sewage**—Raw sewage is bar-screened in the plant's inlet channel. The bars are cleaned on a time cycle by a power-driven rake. Screenings are washed and buried.

The screened sewage then flows by gravity through an aerator and into the tightly inclosed vacuum-flotation unit designed to take 20% BOD out of the sewage.

Application of a partial vacuum in this unit facilitates removal of grease and floating materials—big headaches in most sewage plants. These materials rise to the surface with the aid of entrapped air and are skimmed off by a revolving float and trough, and pumped directly to the digester. Grit, settling to the bottom, goes to a washer.

Pumped to a classifier, the grit is washed and then trucked away for landfill. Overflow from the classifier is pumped back to the VF unit.

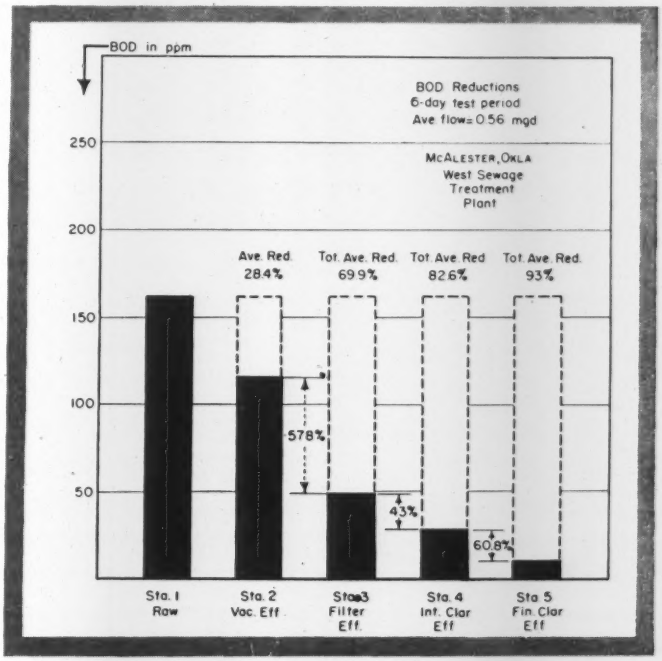
Free of floating materials, vacuum-flotation discharge is raised from a good-size wet well to a roughing filter by three pumps. They deliver a steady flow of 1,400 gpm, consisting of inflow, received through the VF unit (about 550 gpm), and recirculated liquid to make up the difference.

The roughing filter knocks biochemical oxygen demand down further—about 50 to 60%—and adds about 2 ppm of oxygen to the liquid.

Filter effluent gets additional settling in the intermediate clarifier. With 2.5-hr detention, a large portion of the suspended solids are settled out. Deposited on the bottom and raked to the center by a revolving scraper, the sludge is withdrawn by a pump set to operate on a time cycle. Discharge goes directly to a floating-cover digester.

Part of the clarifier's liquid overflow is returned to the roughing filter for recirculation through the plant. The remainder—equal to raw-sewage influent plus secondary-sludge return—flows to the secondary-pump pit.

Three secondary pumps are actuated by float control. These controls are set for six-stage operation so that pumped discharge will equal—as nearly



COMPLETE TREATMENT reduced biochemical oxygen of the raw sewage an average of 93% over a six-day test period.

DESIGN AND ENGINEERING DATA

West Side Sewage Treatment Plant, McAlester, Okla.

Population: Plant serves 18,500, two-thirds of city's residents.
Sewage: Domestic with some industrial wastes; 275 to 350-ppm BOD; 200 to 250-ppm suspended solids; pH about 7.2, 7.4.
Plant capacity: 0.8 mgd (1.25 times average daily observed flow rate).
Treatment: Screening; vacuum flotation; roughing filter; intermediate clarifier; low-rate filter; final clarifier; and sludge digestion and drying.
Screens: Bar, automatically cleaned on time cycle; bars 2 × ⅜ in—spacing 2⅛ in.
Screenings disposed of by burial.
Vacuum flotation: 12 ft dia; 12-ft swd; 111 sq ft surface area; design overflow 10,000 gal/sq ft/day; purpose-removal of all floating material and 20% BOD; aerator preceding unit has 54 cfm air capacity, is 4 × 14 ft. in plan; 50-cfm mechanical grit classifier.
Primary pumps: Three 700 gpm units each driven by 15 hp electric motor; float controlled from well. Wet well has 7,000 gal capacity.
Roughing filter: 65 ft dia; 4-ft side depth; 4 in. broken-stone filtering medium; rotary distributor,, design loadings; Organic—4,000 lb per acre-ft per day; liquid-surface—26 mgd per acre per day.
Primary clarifier: 60 ft dia; 10-ft sidewater depth; 2.4-hr detention period at design flow; sludge withdrawn by pump actuated on time-clock cycle.
Secondary pumps: Three units on float control; Capacities and motor sizes are: 700 gpm at 15 hp, 400 gpm at 10 hp and 300 gpm at 10 hp. Wet well accommodates 7,000 gal at maximum height.
Low-rate filter: 80 ft dia; 8 ft sidewater depth; 7 ft of 4 in. broken stone.
Design load: 350 lb BOD per day per acre-ft of filter media.
Final clarifier: 40 ft dia; 5.25-ft deep; 2.0 hr detention on design rates:
Sludge digester: 45-ft dia; 22-ft swd; 35,024 cu ft total capacity; gas collection and burning; floating cover.
Sludge drying: Open sand beds; 12 50 × 25-ft beds with 15,000-sq ft total area; Underdrain to plant discharge; mechanical sludge pick-up and conveyor for truck loading.
Overflow rate: 700 gal per sq ft per min.
Effluent discharge: To Sandy Creek, a tributary of the South Canadian River.
Cost of plant: $236,000 (1949).

as possible—inflow into the pump pit.

Discharge from the secondary pumps flows onto the final filter. This is a standard-rate unit, designed to effect a high degree of treatment.

Filter effluent is clarified in a final settling tank before discharge to Sandy Creek, a tributary of the South Canadian River. This unit insures that most of the particles are removed from the sewage liquid.

Sludge is continuously drawn off from the bottom of the settling tank and flows by gravity back to the primary-pump pit. This insures a clean, efficiently functioning final clarifier at all times.

• **Solids handling**—Sludge, drawn from the intermediate clarifier, and floating materials from the vacuum-flotation tank, are digested in a closed tank. Digestion is speeded by heating circulated sludge and gas is collected under a floating cover.

Digested sludge is dried on open sand beds. Underdrainage is discharged to the plant's outfall. Dry sludge is picked up and conveyed to trucks by a power-driven unit that spans the beds. Sludge is sold to nearby farmers for fertilizer.

• **About the tests**—The analyses made to verify plant performance were run on 24-hr composites, proportioned according to flow. Before compositing, samples were iced and stored under refrigeration.

A series of three BOD dilutions were set up for each sampling station (see flow diagram) during four of the six days of test. Two blanks for each complete set of dilutions were also made up. On two days, due to a shortage of bottles, only two BOD dilutions were utilized for each test point. results were obtained, however, that checked closely.

Flow was measured with a recording gage. It checked to within 10% of weir measurements. When the gage's meter jammed on one of the days, flow was measured manually at the weir.

All tests were run according to procedures described in STANDARD METHODS FOR THE EXAMINATION OF WATER AND SEWAGE, 9th ed. 1946, published by the American Public Health Assn., New York City.

• **Roughing-filter loadings**—Recirculation was measured as closely as possible during the test period. It was found to be about 1 to 1. This means that an amount equal to plant inflow was returned from intermediate clarifier for re-treatment with raw sewage on the roughing filter.

Average BOD loading applied to this filter was about 696 lbs per day—1.42 lbs per cu yd per day or 2,290 lbs per acre-ft per day—based on 1 to 1 recirculation.

The roughing filter removed about 32.5% if the applied load under a dosing rate of about 12.9 mgad. It had been in operation about seven and a half months prior to the test. This period of operation resulted in good bacterial growth and conditioning.

• **Officials**—Six-day operating tests on the plant were conducted by A. J. Fox of The Dorr Co., Stamford, Conn. The tests were requested by the Oklahoma Department of Public Health and the city officials. Either one or both of the authors were always present during the test period.

The vacuum-flotation unit called a Vacuator, as well as all other treatment equipment for grit-handling, filtration and clarification was furnished by The Dorr Co.

Consulting engineer for design and construction of the West Side plant was the Collins Engineering Company, McAlester.

Contractor for construction of the project was Lippert Brothers, Inc., of Oklahoma City.

Plastic road line markers tried in Nassau, Queens

White plastic traffic line markers along 3.36 miles of highways in Nassau and Queens Counties (N. Y.) was included in lettings recently announced.

A low bid of $4,900 was submitted by Traffic Lines, Inc., of New York City. The new plastic substitute for white paint, most modern of road marking devices, is calculated to save its cost many times over by eliminating the necessity of periodic coats of white paint used in marking the usual traffic lines and no-passing zones.

According to plans, grooves four inches wide and approximately one-half inch deep are ground into existing pavement where the traffic line markers are to be laid. After the channel is dug it is dried and cleaned of all dirt and dust. Then white, preformed thermo-plastic filler strips are placed in it.

All plastic traffic line markers, solid or broken, have a uniform width of four inches. The white thermo-plastic material is supplied in lengths of from 60 to 72 inches and is laid at a temperature of approximately 425 deg F.

Then the filler is rolled flat with a hot roller until all imperfections in the adjacent surface are filled.

Solid, broken, single or double lines will be installed for safety purposes and the control of traffic. A broken line consists of 15 feet of marker alternating with 25 feet of space.

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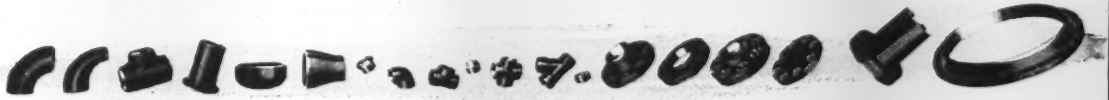

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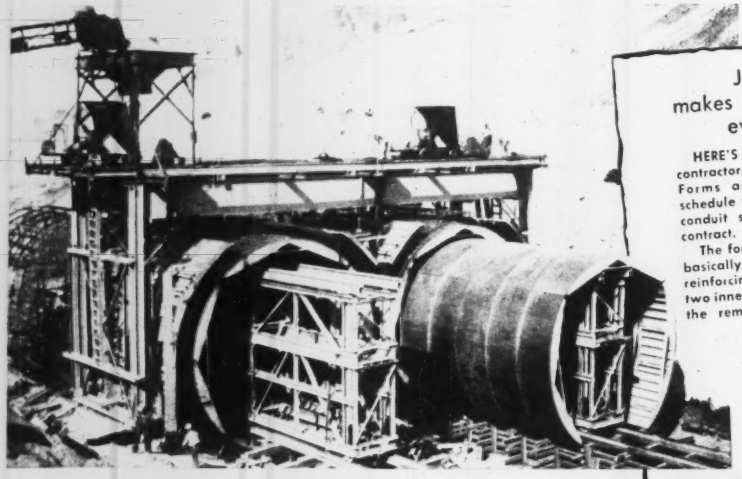
give double-barreled production on GRAND COULEE DAM CONDUITS



J. A. Terteling makes 25-ft. double pour every other day

HERE'S how J. A. Terteling, Boise contractor, combined Blaw-Knox Steel Forms and a systematic working schedule to make real progress on the conduit section of his Grand Coulee contract.

The form setting procedure consisted basically of first setting the bottom reinforcing steel, then telescoping the two inner barrel forms into place. When the remaining reinforcing steel was placed, the rail-mounted outer form gantry with the outside forms was pulled into place and set for the pour. Sufficient forms were provided to permit concreting a 25-ft. length of double 25-ft. diameter conduit every other day.

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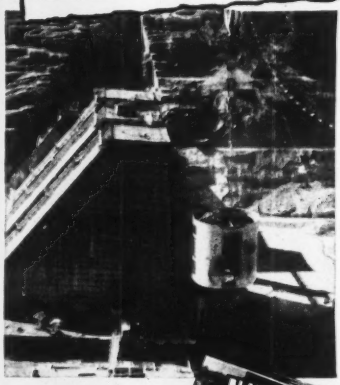

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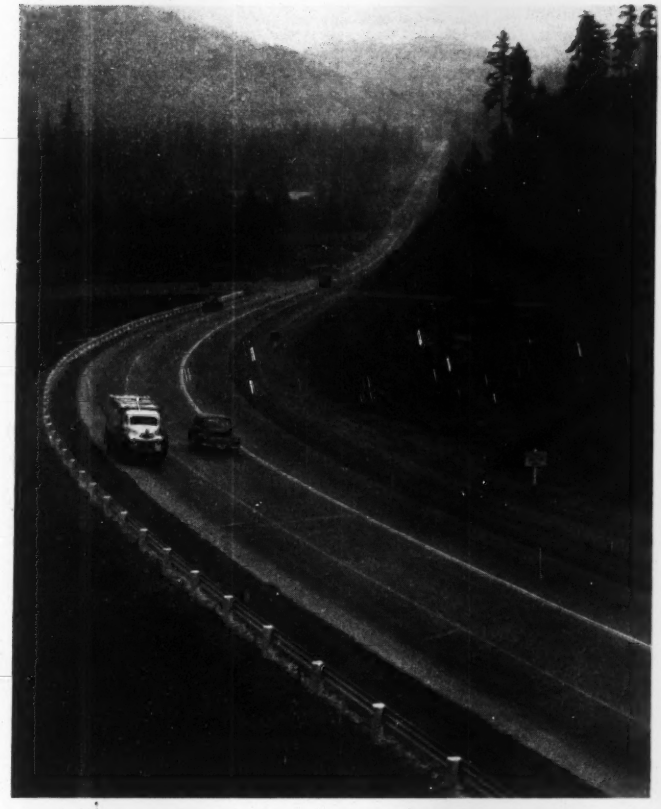


EXTRA LANE on uphill grade of Oregon highway permits easy passing of slow-moving vehicles and a significant time saving. Construction and maintenance costs are reduced.

Extra lanes on grades provide . . .

Cheaper mountain highways

IT'S HARD TO BELIEVE, but Oregon highway engineers have found that cost savings result from adding extra lanes on steep portions of major mountain highways—savings in both first cost and maintenance costs. Additionally, these passing lanes reduce accidents.

Here's how it worked on reconstruction of U. S. 99 between Roseburg and Grants Pass in Oregon:

In the 74 miles between these two cities, this highway, part of the interregional system, passes over three summits of about 2,000-ft elevation each. Traffic is relatively heavy but not heavy enough to justify more than two lanes on ordinary level highway. (In June 1950 average travel was 3,301 vehicles per day with the maximum day being 4,040 on Friday, June 30.)

As the road starts up a grade, an extra lane for uphill travel is added, when the grade exceeds 4%. This extra lane is continued over the summit and part way down the other side. This means a three-way saving in cost as follows:

• **First cost**—Having passing lanes over the summit reduces the required sight distance for safety. Obtaining the necessary sight distance for safe passing on a two-lane road going over a summit would require considerable additional grading to flatten out the vertical curvature. Thus even though three- or four-lane pavement is built, first cost is generally cheaper because of reduced amount of excavation.

• **Operating cost**—Travel over these mountainous sections is faster—the slower truck traffic can be more easily passed on the steeper sections. Surveys indicate that there are three times as many trucks using Oregon highways as there were in 1941. Considerable time and money had been lost due to traffic backing up behind one or two slow trucks on the old alignment—but the new system eliminates these costly traffic delays.

• **Maintenance cost**—The additional pavement width gives plenty of room to store snow during the winter season. This means a significant saving in maintenance cost. Southern Oregon is subject to frequent winter snow storms with a 16-in. snowfall being not at all unusual. With a two-lane pavement going through a relatively deep cut at the summit of one of the grades, there would be no place to store snow. Rotary snow plows could throw the snow high up on the embankment, but it would still be subject to sliding back on the pavement. With the extra lanes, push-type snow plows can be used that merely shove the snow to one side to wait until it melts. This reduces the traveled way to two lanes but that's not too much hardship because the condition lasts but a short time and there is reduced traffic in wintertime.

• **Stage Development**—Reconstruction of the mountainous sections of U. S. 99 between Roseburg and Grants Pass has been carried out under a step-by-step development program over a period of four years. Working north from Grants Pass, the first section was built over Sexton Mountain in 1947 and '48. A second section was built over Stage Road Pass in 1948 and '49. The third section, over a summit in the Umpqua National Forest, was graded in 1950 and will be paved in 1951. Since this latter is the most recent work, it will be described in more detail:

Standards on all three sections are approximately the same. Maximum grade is 6% throughout. Maximum curvature on the first two sections was 10 deg whereas on the most recent work it is only 8 deg. Besides that, more four-lane construction is used on the latter job in place of three-lane construction.

The Umpqua National Forest work is divided into three construction contracts. Two of these are administered directly by the Bureau of Public Roads since Forest Highway funds help finance the work—such funds must be spent by a federal agency. A third contract outside the national forest is administered by the state with federal aid money partly financing the work.

Design follows the pattern set by the state on the two earlier summit

crossings on this same route. Details of the Umpqua Forest work were jointly worked out by state and federal engineers.

• **Old alignment replaced**—The original highway through the Umpqua National Forest area was completed in 1919. Improvements were made in 1922 and '23. However, the road has remained basically the same for the last 30 years. Not that it has been adequate for the traffic in recent years, because it hasn't. But the Oregon Highway officials defer major improvements until they are assured of financing of the complete improvement using modern standards of construction.

Grading work under way in 1949 involved a 6½-mile section handled by the Kuckenberg Construction Co. of Portland under a $1,186,905 contract. Elevation of the road varied from El 1031 at the start of the realignment to El 2015 at the summit and down to El 1657 at the south end. Pavement width included just under 2½ miles of two-lane pavement, 3 miles of three-lane pavement, about ¾ mile of four-lane pavement and just under half a mile of transition between pavement widths. The transitions were 600 ft long between two- and three-lane pavement and 650 ft long between three- and four-lane pavement.

Four-lane pavement is 46 ft wide with a 4-ft shoulder on each side; three-lane pavement is 34 ft wide with a 4-ft shoulder on each side and two-lane pavement is 24 ft wide with a 9-ft shoulder on each side.

Grading work on the Umpqua National Forest section is particularly heavy since the road follows a mountain stream (Canyon Creek) down a narrow canyon. To rebuild the road to up-to-date standards required excavation in the neighborhood of 1,200,000 cu yd. Bid price for this unclassified rock and dirt excavation was 49c per cu yd. Construction proceeded at a rate of 200,000 cu yd a month.

Since the construction period was to extend over many months' time, oiled detours were required. Location of such detours was delineated in the project drawings. Thus, detour layout was almost as carefully designed as was the road itself.

• **Bituminous macadam pavement**—On the recent work, a bituminous macadam pavement was used. This is in contrast to the earlier work where a plant mix asphaltic surface was employed.

Accompanying tables show the nature of the materials used in the pavement. The first spreading of coarse aggregate is placed on a previously placed and broomed base course. It is dry rolled until the aggregate is keyed. Then the first application of hot asphalt is made.

Immediately after the first application, key aggregate is spread and the pavement is rolled while the asphalt is still warm.

Next the second application of bituminous material is made. Chips are spread, rolled and broomed immediately thereafter.

This is followed by a third bituminous application and a spreading of chips and screenings. This is rolled and broomed and forms a first seal coat.

At this point, the pavement is open to traffic for at least four days. After the first seal coat is properly cured, the pavement is swept and a final seal coat placed using emulsified asphalt. In this coat, chips and screenings are spread, rolled and broomed separately. Brooming continues for three days while the road is in use.

• **Direction of the work**—R. H. Baldock is Oregon state highway engineer and has sponsored many of the developments in this relocation work. The Umpqua National Forest work is under the general direction of W. H. Lynch, division engineer, Division 8, Bureau of Public Roads, F. E. Andrews, assistant division engineer, and T. M. Davis, Oregon district engineer.

AGGREGATE GRADING REQUIREMENTS FOR THE BITUMINOUS MACADAM

Serve, Designation (in. or mesh)	Percentage by Weight Passing			
	Coarse	Key Rock	Chips	Screenings
2½	100			
2	90-100			
1½	35-70	100		
1	0-15	90-100		
¾			100	
⅜		0-15	90-100	100
No. 4			0-15	90-100
No. 200	0-2	0-2	0-2	0-10

SEQUENCE IN LAYING THE BITUMINOUS MACADAM PAVEMENT

	Amount per Square Yard of Pavement					
	Kind of Bitum. Matl.	Bitum. Matl. (gal)	Coarse Aggr. (cu yd)	Key Rock (cu yd)	Chips (cu yd)	Screenings (cu yd)
1st spreading			.06			
1st application	*120-150	1.00				
2nd spreading				.02		
2nd application	*120-150	.35				
3rd spreading					.01	
			Liquid Seal and Cover			
3rd application	*120-150	.30				
4th spreading					.006	.003
4th application	Emulsified asphalt	.25				
5th spreading					.006	
6th spreading						.003
Stockpile					.005	
Total		1.90	.06	.02	.027	.006

*Penetration grade 120-150, AASHO spec M-20 or M-23

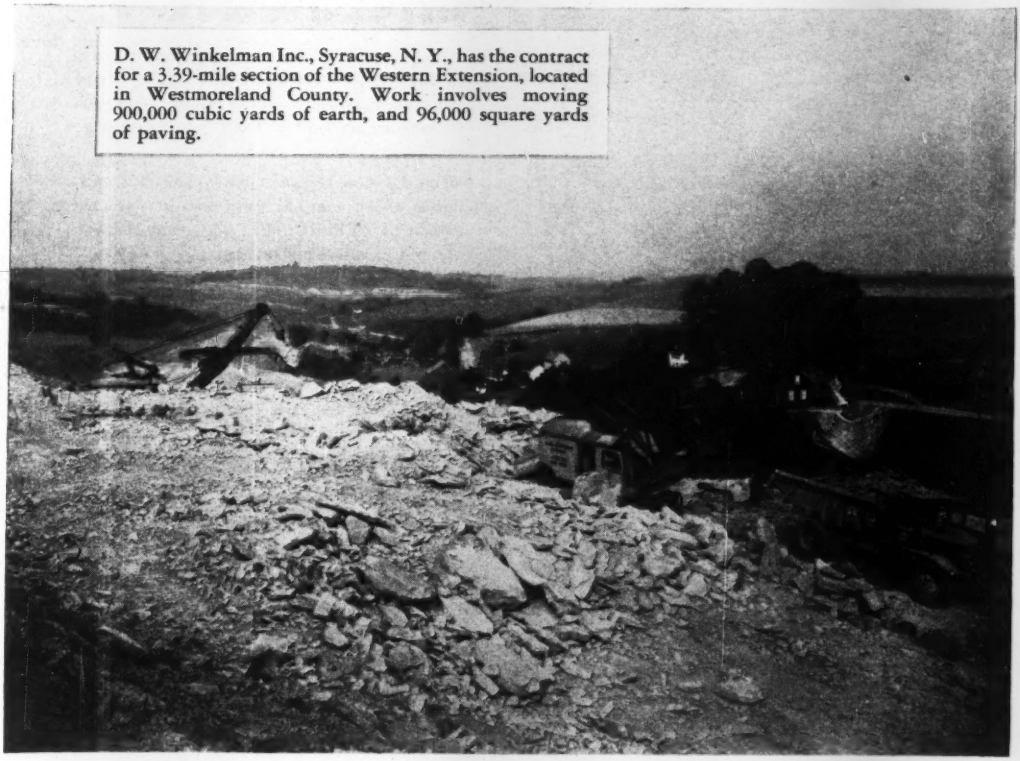
Portable storage tank

A 10,000-gal fuel storage tank that can bet set up in 10 min has been developed by the Army's Engineer Research & Development Laboratories in conjunction with the Goodyear Tire & Rubber Co. This collapsible pillow-like container is formed from a ⅜-in.-thick sandwich of Buna N synthetic rubber and nylon cloth. A coating of liquid nylon (0.0002 in. thick) applied to the inner surface prevents leaks (tested for 1 yr with 91 octane gasoline). The tank has been winter tested at minus 45 deg F. The tank is transportable in a wooden container, and is set up by unrolling like a rug on any flat surface. One connection serves as both inlet and outlet.

GULF PRODUCTS *and* FINE SERVICE

keep equipment rolling on Western Extension

of the Pennsylvania Turnpike



D. W. Winkelman Inc., Syracuse, N. Y., has the contract for a 3.39-mile section of the Western Extension, located in Westmoreland County. Work involves moving 900,000 cubic yards of earth, and 96,000 square yards of paving.

THE Western Extension of the Pennsylvania Turnpike is another big and important project where the majority of contractors rely on Gulf to help keep equipment delivering top performance.

Leading contractors, like D. W. Winkelman, Inc. for example, know from experience that Gulf quality lubricants provide an extra margin of protection against mechanical delays. And that Gulf fuels insure full engine power and efficiency.

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READER COMMENT

Against over-design

Sir: Having read your editorial on the saving of reinforcing steel by raising the bond stress, (ENR Feb. 8, p 21) it occurs to me that a whole lot more steel could be saved by leaving it out where it does no good.

Some designs remind me of what Hardy Cross told us seniors at Brown University back in 1916.

Said Hardy Cross: "You could take some black paint and a brush, and with it paint the bars on the side of the footing (or wall, or beam) and do as much good as is done by some of the bars that are put in concrete today.

"The only good that some of this steel does is to displace and save a little bit of sand, stone and cement."

Hardy Cross' comments would still apply. Some of these modern designs are turned out on the theory that no building ever fell down from containing too much steel, therefore when in doubt give it the rods.

There out to be a law.

G. D. HOUTMAN
Media, Pa.

Early consulting contractor

Sir: In ENR Nov. 2 was an editorial, "New Role For Contractors," the last paragraph of which said "The role of consulting contractor is a new one. . . ." This editorial was of considerable interest to me because I think I acted as a consulting contractor in one of the very early instances where that term was employed.

This was in connection with a water-supply project for the Colombian Government in 1936. At that time, Colombia was constructing a new water-supply system for its capital, Bogota. Two contracts had been let to U. S. contractors; the first covered a large earth dam and a reservoir, and the second a concrete pipeline of considerable length to connect the city with the reservoir. A third and last contract was to be for a filter plant to be built on the outskirts of Bogota.

The consulting engineer was the firm of Chester M. Everett, successor to the old and well known firm of Hazen and Whipple. My company, The Tuller Construction Co., had two contracts underway at that time under the supervision of Chester M. Everett. Both of these contracts were for the City of Danbury. One covered the construction of a filter plant and the other a steel supply main.

Mr. Everett told me that the Colombian government was anxious to have a Colombian firm execute the last contract in the project—the filter plant. He said that he had agreed to this on the condition that a "consulting contractor" be employed who would visit the site, decide on the proper equipment, advise on its selection in the United States, secure a competent superintendent, and otherwise assist the Colombian firm. Mr. Everett offered me the appointment. A mutually agreeable fee was agreed upon and I accepted.

An interesting experience followed, in the course of which I flew to Bogota and became acquainted with the Colombian officials and the South American contractors, Lobo Guerrero & C. S. DeSantamaria. Equipment was selected and purchased in the United States after my return. I had some misgivings about being able to obtain a superintendent who would function satisfactorily in a country where the conditions are so different from what they are in the United States. However, the man selected produced to the satisfaction of all parties concerned. The construction of the filter plant, which was the equivalent of a plant costing $1,000,000 in the United States at that time, was accomplished with no unusual incidents.

No other instance of the employment of a consultant contractor has ever come to my attention, which accounts for my particular interest in your editorial.

J. D. TULLER
The Tuller Construction Co.
Red Bank, N. J.

Objection

Sir: No! The people of Maryland are not building the great Chesapeake Bay Bridge to by-pass our largest city —Baltimore—and to provide a new route to Baltimore's largest suburb, Washington, D. C. (ENR Mar. 29, p. 97).

We are building that bridge to draw the two shores of our state closer together—to make it easier for our Eastern Shore people to trade with Baltimore, and for Baltimoreans to have quicker and easier access to our Maryland bay and ocean resorts.

Where do your people get such weird ideas about us?

VICTOR E. SCHMINKE, SR.
Baltimore, Md.

(We looked at the map—which also confirms Mr. Schminke's assertion—Editor)

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USERS KNOW BONDACTOR DOES A BETTER JOB . . . PAYS FOR ITSELF IN SAVINGS

Both large and small contractors have proved that one job can oftentimes pay for their own BONDACTOR. Then the savings and profits from future work are all yours! BONDACTOR assures accurate, high-speed application, better hydration of cement, easy operation and maintenance, best possible "bonding action," plus many other outstanding advantages.

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10 to 15 lbs.

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Work like hydraulic

★ COMPLETE
Scab, Tee-head, and Extension allow for every type of use

Try these shores on your next job. See for yourself . . . you'll be convinced that Symons Shores are FIRST CHOICE because of the savings they will mean to you in time and money.

Symons Column Clamps Save Money on Every Job

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Only two units—both alike, no loose parts

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Require only a hammer, and are completely adjustable

★ SQUARE COLUMNS
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These simple compact units put tidy savings in your pocket. Their function is clear—to do a good job, at a low cost, with complete accuracy. That's precisely what they do.

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FIELD AND OFFICE

INGENUITY in use of readily available materials pays off for contractor as . . .

Ramp speeds delivery of aggregate to plant

A curious looking assembly of piles and logs resembling a stockade permitted the contractor to save money at the site of an addition to the Veterans Hospital at Minneapolis. Built with materials readily and cheaply available, this job-made ramp permitted trucks to dump aggregate directly into the plant hopper.

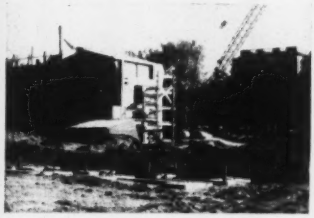
The ramp was constructed by Carl Blander & Sons Co., excavation subcontractor, and consisted of two 150-ft rows of piles spaced 16 ft apart. The piles were spaced on 8-ft centers and were driven 10 ft into the ground. They varied in height above ground from 30 ft at the upper end to 5 ft at the lower end. A row of high piles on 3-ft centers was driven to close the upper end. After all piles were driven, a wall of horizontal logs was laid around the entire inside perimeter to a height of 5 ft. A network of steel cables, laced between rows of piles, ran both transversely and diagonally. The enclosure formed was filled with compacted sand.

The finished ramp was 25 ft high at the top and sloped 1:6 to meet existing grade. Roadway was paved with broken stones, and a heavy timbered guard rail was attached to the piles above the ramp.

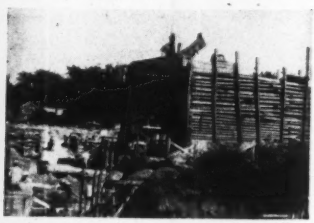
The ramp was built entirely of salvage material. It proved to be very stable, and served its purpose well. Total cost of the structure (including its removal) was $1,546. This cost includes a reasonable figure for resale of the earth to be used as back fill around the buildings, and for resale of the poles. Truck drivers performed all work incident to unloading into hoppers, and no additional labor was required. Thus, as 27,000 yd of concrete were placed, the cost for aggregate handling was $0.057 per yd.

However, if mechanical hoisting equipment had been used to load aggregate into the hoppers, the cost for handling aggregate is estimated at $10,036.40, or $0.372 per yd. This figure includes first cost of equipment amortized at 10%, cost of maintenance, fuel, and related items; and labor for 270 eight-hour days.

Thus, the estimated savings figures out to $8,505.00, or $0.315 per yd.—R. A. Phelps, Col-CMLC-AUSR, Fort Snelling, St. Paul 11, Minn.



Concrete plant is a normal 3-level unit with bins for cement, sand, and gravel.



Top of bin is 1 ft above ramp, permitting direct discharge without extra handling.

RECLAIM Old Pavements with a WOOD PREPARIZER

(It Scarifies • It Pulverizes • It Prepares)

Hook a Wood P-600 Preparizer on a D-7 or equivalent and you can scarify and pulverize old asphalt or macadam at the rate of a mile a day on a 22' pavement. The Wood P-600 Preparizer completely reclaims and prepares old asphalt or macadam into select aggregate for low cost, 100% reuse. Even the old oil is retained. Nothing is lost. No need to import aggregates or materials. ☆ The Wood Preparizer is not a converted piece of agricultural equipment. It is a contractor's tool, designed and built to do just this kind of work — and more! Diesel-powered. One-man operated. ☆ The Wood Roadmixer, a complete traveling mixing plant available in 3 models, takes these or other prepared materials and in one pass delivers up to 350 tons per hour of ready-to-spread mix. ☆ The Wood Preparizer and the Wood Roadmixer are the finest combination of roadbuilding equipment ever developed for reclaiming and rebuilding old pavements. They will pay for themselves many times over in savings in materials, time, equipment and man-power. ☆ See your Wood distributor or mail the coupon for literature and prices on Wood Roadbuilding Equipment.

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J. Robert Bazley boosts with

Big 12'5" x 8' top opening speeds shovel swings, reduces spillage. Bazley's 4-yd. stripping shovel heaps 15 bank yards of sand and clay into Tournarocker body in 2½ to 5 minutes, depending on bank conditions.

Stripping 3,000,000 cubic yards of sand, clay and rock from anthracite coal deposits at Mt. Carmel, Pennsylvania, J. Robert Bazley, Inc. of Pottsville has been using 3 rear-dump C Tournarockers for nearly a year to haul from a 4-yard stripping shovel.

Complete 4200′ cycle in 7.4 minutes

Tournarockers are loaded in an average of 3 to 4 passes from the well-heaped dipper . . . carry 15 bank yards per trip. Checked on a typical 4200′ cycle, each 16-ton rig averaged a round trip every 7.4 minutes . . . including 3.6 min. to load, 0.3 min. to dump, and 3.5 min. for haul and return. Conventional dump trucks of smaller capacity, loaded by the same shovel and traveling over the same haul road, averaged 7.9 minutes for the same cycle.

In 5 months . . . only 7% downtime

In 2,000 hours of operation, the Tournarockers have maintained a 93% job efficiency record. "We're particularly impressed with the clean dump, the safety when the rear wheels are over the edge of the dump, and the extreme maneuverability of the units," says J. Robert Bazley, Company President.

In addition to these 3 LeTourneau rear-dumps, Bazley also is working 2 of the same C Tournapull prime movers with 16-ton Carryall Scrapers at the Mt. Carmel mine. These 186 h.p., electric-control prime movers are also interchangeable with flat-bed and bottom-dump haulers, as well as on scrapers, rear-dumps and other equipment.

Check the economy of these modern, 35 m.p.h., rubber-tired rigs for yourself before starting any major stripping operation. With these up-to-date LeTourneau units in your production fleet, you'll find that you can get lowest-net-cost-per-yard in any type of material, in any kind of weather, and on any sort of job. See your LeTourneau Distributor for complete facts and figures, or write TODAY.

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Mail today to: **R. G. LeTOURNEAU, INC., Peoria, Ill.** for more information on 35 m.p.h.

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CITY..... STATE.....

Type of work handled.....

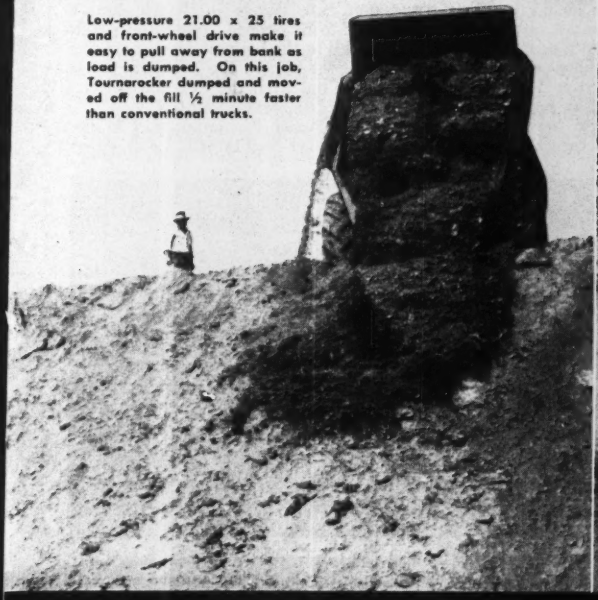
C Tournapull for use with:

- ☐ 17 cu. yd., rear-dump Tournarocker
- ☐ 13.5 cu. yd. Carryall Scraper
- ☐ 15 cu. yd., bottom-dump Tournahopper

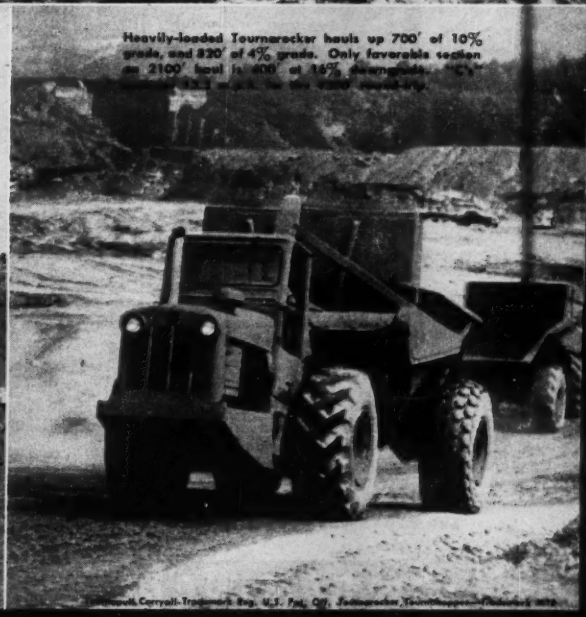
strip production

3 "C" TOURNAROCKERS

Low-pressure 21.00 x 25 tires and front-wheel drive make it easy to pull away from bank as load is dumped. On this job, Tournarocker dumped and moved off the fill ½ minute faster than conventional trucks.

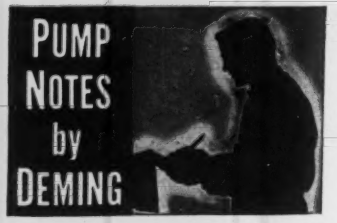


Heavily-loaded Tournarocker hauls up 700' of 10% grade, and 820' of 4% grade. Only favorable section on 2100' haul is 400' at 16% downgrade. "C's" [illegible]



LETOURNEAU PEORIA, ILLINOIS TOURNAROCKERS

HIGH SPEED on RUBBER PLUS TRACTION ADVANTAGES of a CRAWLER



Sump Pump

The Deming Vertical Turbine Pump illustrated has applications which include high service pumping, recirculation, cooling, drainage, process pumping, and other industrial uses.

Advantages of this pump are high efficiency, compactness, simplified installation, elimination of priming devices, and low maintenance cost.

This pump is designed to take suction from sump, reservoir, lake, river, or any similar source.

For booster service, the pump may be connected directly to suction line with a flexible pipe coupling, or it may be mounted in a closed well.

When used for construction purposes, the pump may be installed on temporary supports, or suspended from a hoist or derrick.

For temporary use, the pump may be operated with a short length of column. By adding additional lengths of column and shaft, the pump can be adapted for deep well service. Various types of drive are furnished for this pump to adapt it to the available or most economical source of power.

Capacities range from 15 to 3000 G.P.M. at pressures up to 175 lbs. For higher pressures, special construction is available.

Complete details about this and various other Deming Vertical Turbine Pumps are included in BULLETIN No. 4700. Send for a copy.

THE DEMING COMPANY
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SPECIFY DEMING PUMPS

FOREIGN

Swedes store oil underground in disused mine and save money

When oil has once been taken out of its natural storage in the earth's crust, it is a problem to know what to do with it until it can be used. Storage tanks above ground are highly vulnerable in wartime, and underground tanks are expensive.

To Harald Edholm, superintendent of supplies for Sweden's government Hydroelectric Power Board, the obvious way out of the dilemma seemed to be to put the oil back into the earth again.

Together with a Swedish Navy expert, he took a look at some disused mines in the Stockholm archipelago. A feldspar mine, which has just been worked out, was selected and purchased in 1947. Making it ready for oil storage took one year.

Oil is stored in the mine between sea level and 230 ft below. The oil is pumped in and out of storage at a point 50 ft below sea level. The oil level is kept from falling below the 50-ft mark by pumping water into the bottom of the mine—the last 80 ft of which is always kept filled with water.

Work involved in fitting the mine for oil storage included roofing over the main opencast with a concrete dome, with a 8,600-sq ft area. A smaller opening was filled with a concrete plus, and both covered over with broken rock. All that is now visible above ground are three small buildings and the tanker pier carrying the pipe lines.

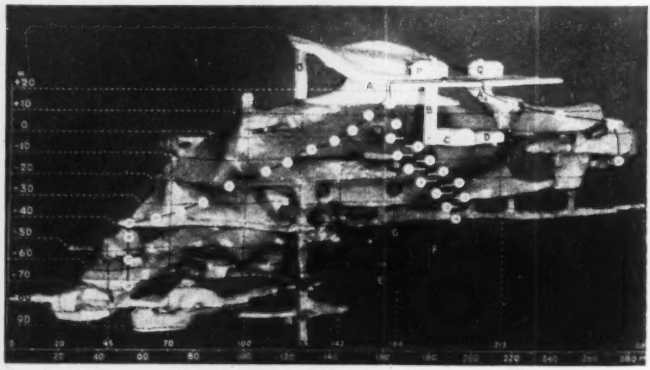
Only the salt water pumps are above ground. The oil pumps are in a chamber blasted out of the rock at the storage intake level 50 ft below sea level—nearly 90 ft below ground at that point. In an adjacent chamber are the boilers for the hot water system which keeps the oil flowing freely.

Besides these chambers, a shaft had to be driven for the smokestack, and to provide access. Also new was a special gallery for the hot water radiators which keep the oil at the desired low viscosity. Water is pumped in and out of the bottom of the mine through two holes drilled from the surface to a new passage which was driven to about the 260-ft level.

Costs of preparing the mine for oil storage were only one-seventh of what underground tanks would have cost in Sweden at the time. Metal cisterns placed in cavities blasted out of the rock would have cost about $25 per cu.m. of storage space. The mine cost only $3.50. Even if placed in an existing mine cavity, tank storage would cost about three time as much.

The mine has a further advantage over tank storage in that it doesn't have to be cleaned. Impurities which settled in the bottom of tanks run out with the oil. In the mine, the oil is taken out from the top, and is practically free from impurities.

The reason it is unnecessary to line clean mine cavities with metal is that



UNDERGROUND OIL STORAGE—The model shows the hollowed out mine cavity. The dark area shows the maximum oil storage limits. Oil is pumped in and out of the mine at zero level. B marks the new access shaft, through which the smokestack from the boiler room C runs. Oil pumps are in the adjacent underground chamber D. A gallery running out from D has one end open to the mine cavity, and houses the hot water radiators for warming the oil and reducing its viscosity.

GOOD NEIGHBORS – John Russell Young, District of Columbia Commissioner, left, exchanges key to the city of Washington for that of the city of Lima, Peru, with Eduardo Dibos, mayor of that city. Senor Dibos was here to discuss with officials of the International Road Federation the Fifth Pan-American Highway Congress to be held in Lima next Oct. 8-14.

the pressure of the ground water keeps the oil from seeping out. At no point around the Flaxenvik mine is the water table less than 12 ft higher than the maximum oil level.

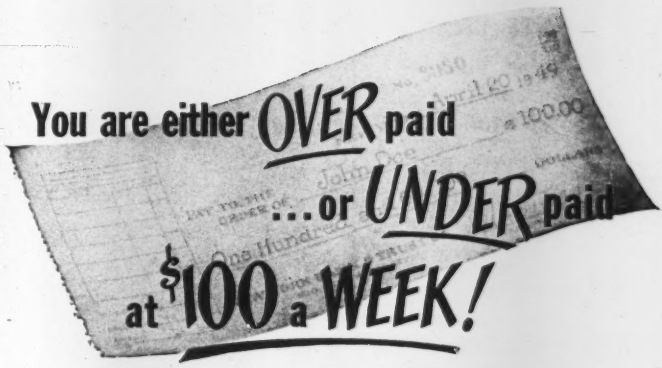
It doesn't matter about water seeping into the oil. The water drops do not emulsify, but sink down and form a layer of bubbles where the oil and water bed meet. Gradually the oil film holding the drops bursts, releasing the water into the bed.

At Flaxenvik, oil can drop onto the oil surface at only one point–and not at all when the oil is up to the highest storage level. Actually, the water content of the oil delivered from storage here is lower than as it comes from the tanker.

Temperature of the oil in the mine, and of the water bed, is measured electrically at 32 points through its depth and length. To keep high viscosity oils flowing, the temperature in the outtake gallery can be raised to around 100° F, by means of the hot water radiators installed there. Also, to keep down the viscosity of the upper oil layers, when raising the level by pumping in water, is a 1,500-ft copper heating tube (2 in. dia) projecting out into the storage area. This prevents oil sticking to the mine side walls.

After the mine had been in use for a year and a half, the temperature of the oil in the upper layers was around 50° F–although the mine temperature at the start had been around freezing.

To inspect their new storage facility, the Power Board engineers have to row around on the surface of the oil in boats.



IF you are earning about $5000 a year, you have reached the most *critical* stage of your business career.

Few men are paid that amount unless they are *potentially worth $10,000.*

It means someone above you thinks you are capable of making at least twice your present salary. But *you* have to prove it!

Five thousand dollars is not a terminal – a man goes on or back. Clerks can be hired for less; executives can demand more.

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Here, briefly, is the Institute's function: It stimulates your desire to forge ahead, awakens hidden abilities, supplies the training and knowledge every executive must have. It shows you, by practical examples, the methods and procedures followed by management. It enables you to *bridge the gap between your present job and the one above.*

Don't misunderstand. The Institute works no miracles, opens no magic portals to quick and easy success; it will *not* double your income within a few months. Nor will it make corporation presidents of men who are clerks at heart.

But to the man who seeks a sound and realistic program to speed up his progress in business, the Institute's Modern Business Course and Service is ideal. Ideal because it fits the new concept of management, prepares men to handle the *larger* opportunities of business.

Suppose the management of your company met to select a new vice-president, Factory Manager, Sales Manager or Personnel Director. Suppose *you* were a possible choice for one of those positions.

Are you qualified to step into such a job? Is your knowledge broad enough to meet the requirements of an executive position – or do you know little of business outside of your own department?

Will you be qualified two years from today?

Only men who understand the fundamental principles of all departments of business can safely be trusted with important administrative responsibilities.

The Institute offers you a practical, concentrated means of obtaining that knowledge in your spare time.

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So far as it has been possible to do so, the Institutes executive training plan has been outlined and described in an interesting booklet titled "Forging Ahead in Business."

There is no charge for this little book because it is worth only what *you* make it worth. Some men glance through it and toss it aside; others have found a fortune in its pages. It is a serious book about a serious subject; as such, it holds nothing for the merely curious.

But it contains a message of lasting significance to men who are concerned about where they are going in business, and how they are going to get there. To men of this type, copies of "Forging Ahead in Business" are available without cost or obligation. Simply fill in and return the coupon below.

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MUNICIPAL

YONKERS—nextdoor neighbor of New York City—faces many problems similar to those of the metropolis although naturally of lesser magnitude. For Yonkers this new centrally-located parking field is a big step toward easing traffic congestion; more than 8,000 cars a week already use it. The population of Yonkers is 152,533.

Metered parking made ready for 350 cars in Yonkers

Yonkers, N. Y., recently put into operation its first metered off-street parking area—a 350-car facility practically in the heart of the important Getty Square shopping district.

Convenient access, adequate space per car, proper lighting and good drainage were the design features given special consideration by Earle Griffen and his city engineer's office staff in planning the field.

The four access streets carry two-way traffic; traffic in aisles between parking stalls is all one-way. Stalls, marked out for angle parking, are generally at 60 deg to the curb and are 8½ ft wide for greater ease in parking, less chance of damage to car bodies and fenders.

Pavement—A 2-in. asphaltic concrete wearing surface on a 4-in. penetrated macadam base—has no crown, but slopes from curb to curb with sufficient pitch to carry water to the drainage system.

Perimeter walks 8 ft wide and 6-ft-wide meter walks are adequate for safe pedestrian traffic to and from cars. Pipe sleeves in the concrete walks to receive meter posts are placed 1½ ft in from the curbs and at the centers of the parking stalls.

Twelve steel lamp posts, wired underground, carry refractor luminaires and 15,000-lumen lamps 32 ft above the pavement for a nearly uniform lighting of 0.8 ft-candles.

Relatively high construction cost of $230,000 is due largely to the need of bridging a small stream (Nepperhan Creek) with two of the access streets. Total cost, construction plus real estate, will be divided equally—half to be paid by a special assessment against property deemed to be benefited directly and half by the city at large.

Mayor proposes new plan for Port of Baltimore

A plan for improving the Port of Baltimore by establishing a new Port Commission and by the expenditure of $30,000,000 of loan funds has been submitted to the General Assembly for consideration during this session. The plan was recently announced by Mayor D'Alesandro and it is based primarily on the proposals of the Association of Commerce. The association undertook a survey of the port last year and issued a detailed report, including recommendations.

Under the mayor's proposal, the present Port Development Commission, which has existed for 32 years, would be abolished and the suggested Port of Baltimore Commission established for the purpose of supervising the spending of the loan funds. The new commission would consist of seven members, appointed to serve for four years without compensation, as follows: One member designated by the governor to represent the state; one member by the mayor; one

(Continued on page 62)

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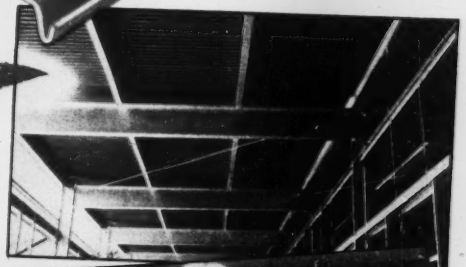
less weight!

• When you build with steel roof deck, you save weight *two* ways. First, the light weight of Wheeling Tri-Rib Roof Deck Sheets reduces dead load. Second, the lighter roof allows the use of lighter beams, columns and footings.



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• You save work and time too with Tri-Rib Roof Deck. Sheets are easy to handle and are quickly installed by welding or clipping. You cover large areas in a short time—with less time lost from stopping work because of bad weather.

less cost!

• With lighter weight of supporting members, a Tri-Rib Roof Deck saves money on structure and in time required for roofing. Made of Cop-R-Loy, the Copper Alloyed Steel, Tri-Rib is designed in accordance with specifications adopted by A.I.S.I. for light gauge structures, dated January, 1949.

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Hydraulic Torque Converter Drive
175 net engine hp.
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70 drawbar hp.
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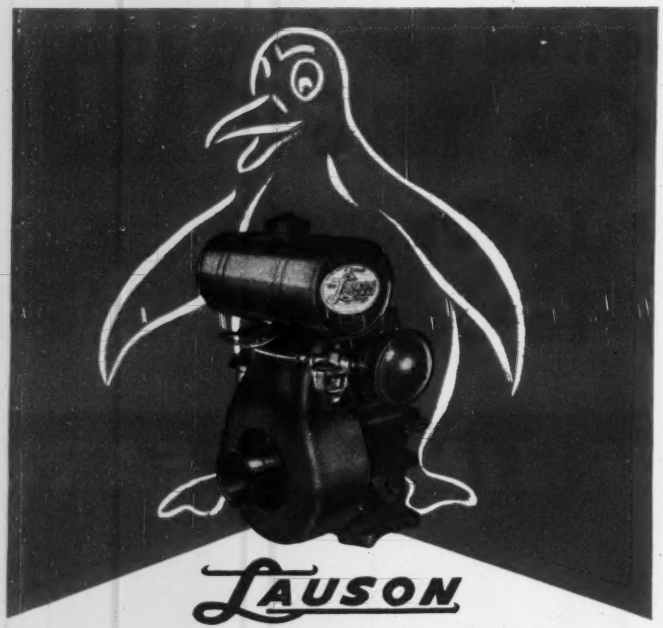

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by the Maryland Motor Truck Association; one by the Association of Commerce; one by the Steamship Trade Association; one by the railroads in the city; and the seventh would be director of public works of Baltimore who would serve in an ex officio capacity. The chairman would be selected by the commission from among its members.

The General Assembly has been asked to authorize the city to borrow the $30,000,000 which will be used for acquiring property for the port; reconstructing and equipping existing structures and facilities; constructing new structures and facilities; demolishing, or removing buildings and constructing or improving streets; utilities and other similar items; acquiring floating equipment needed to keep the port open for navigation; and for administration expenses of the new commission. If the assembly approves the loan, it will be placed before the voters of Baltimore in the spring election.

Projects to be built with the loan funds will not all be self-liquidating as they have been until now. Private parties may lease city property and are required to reimburse the city for a minimum of 60% of the expenditures. The city will, however, retain title to the property. Any expenditures of the loan funds will have to be approved by the Board of Estimates.

Street improvements urged—Severe traffic congestion is ahead for the downtown area of Tacoma, Wash., unless four major street improvements are instituted, the Tacoma Planning Commission has warned. The commission's report calls for a new bridge providing access to the business district from the industrial section on the east side, two by-pass streets to route through traffic bound for the new Narrows bridge, a freeway to replace the present route of U. S. Highway No. 99, and more through streets in the business district.

Anti-pollution progress—In Georgia more than 200 cities and towns have sewer systems. In the last 20 years 56 towns have installed sewage works—a gain of 38 percent—and the majority of those still without such facilities are planning for them, according to the state department of public health.

Water profits—Toronto, Ont., in 1950 made nearly $1,000,000 profit on the sale of water to citizens, industries and suburban municipalities. Gross revenue was $4,828,507, and estimated cost of operations amounted to $3,882,101. Suburban municipalities purchased $604,560 worth of water at 17 cents per 1,000 gal.

P&H DIESEL ENGINES

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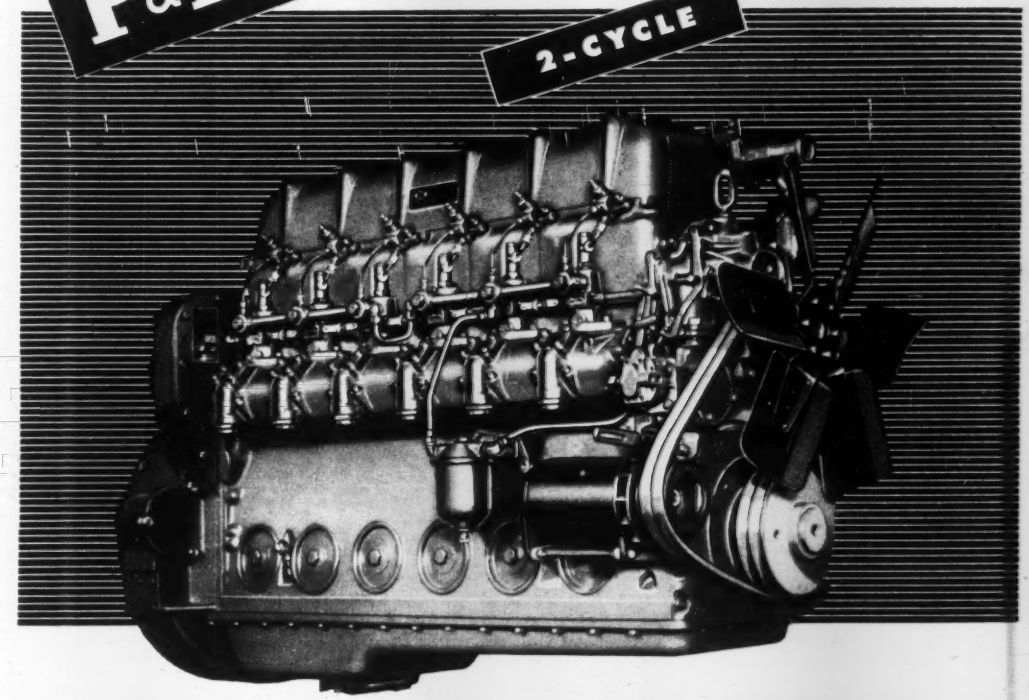

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That's normal operation for power shovels—the toughest assignment known for diesel engines. It's the service P&H Diesels were designed to take. Years of superior performance, attested by hundreds of users, prove that P&H Diesels can take *any* of your toughest jobs in stride. It's one reason wise users are standardizing on P&H Diesels. There are many other reasons worth learning. For literature, write Diesel Division, Harnischfeger Corporation, Port Washington, Wisconsin.

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SAVED...time, money and materials!

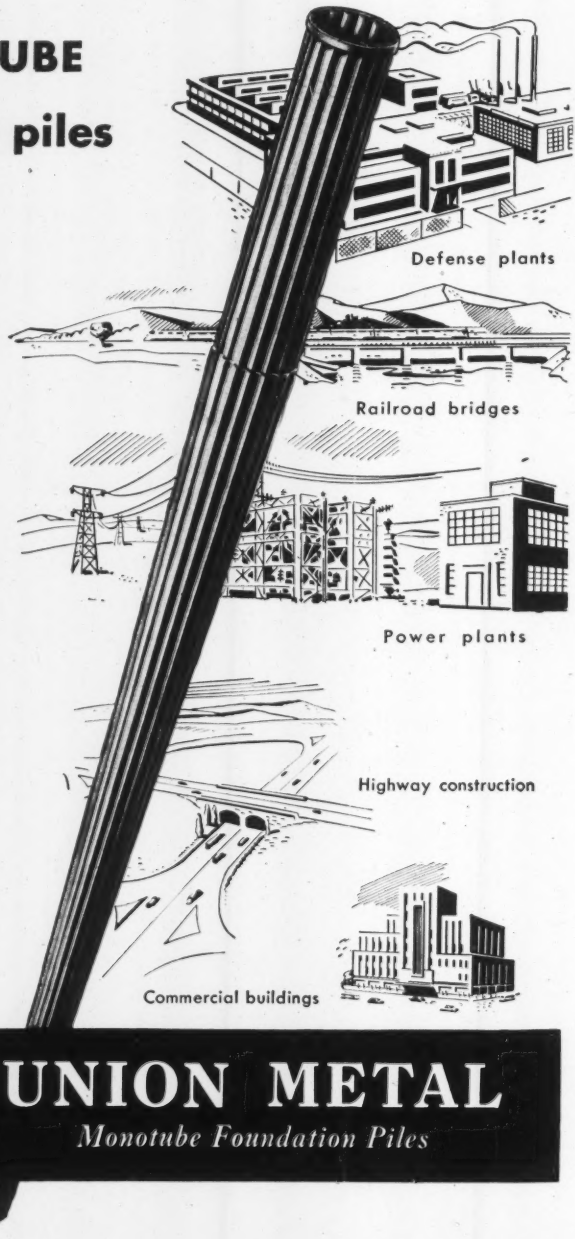
...with MONOTUBE taper-flute steel piles

THESE days, when conservation is a must, you'll want to take a *close* look at Monotube advantages and economies. We can't give you the whole story here, but as a starter, remember these facts . . .

CONSERVING MATERIALS! Due to their tapered design and cold-rolled properties, Monotubes *save steel* while providing unusually high bearing values and exceptional lateral stability. Result? Steel is conserved and required loads can often be carried by *fewer* Monotubes. Moreover, Monotube on-the-job extendibility, with easy cut-off and simplified weld-splicing, is another *big* factor in conserving materials.

SAVING TIME AND MONEY! Naturally, the above advantages save time and money as well as materials. But, *in addition,* Monotube taper-flute design results in *faster* driving. Lighter, standard driving equipment generally suffices even on the *tough* jobs! Then, too, because Monotubes are lighter in weight, they're easier, faster to transport, handle and locate.

Weigh these advantages. Then get *all* the facts and check them against your important construction projects ahead. You'll see many ways in which Monotube taper-flute steel piles offer material conservation as well as unusual economy all along the line. For complete data, write to The Union Metal Manufacturing Company, Canton 5, Ohio.



UNION METAL

Monotube Foundation Piles

MEN AND JOBS

CHEERFUL DELEGATES—D. S. Walter, Bureau of Reclamation regional engineer at Boise, Idaho, right, relates an amusing incident at the recent construction engineers conference, Denver, Colo. Shown with him are, left to right, C. H. Spencer, construction engineer of the Hungry Horse Dam, Montana; W. A. Dexheimer, assistant chief construction engineer, Branch of Design and Construction, Denver, Colo.; and R. K. Durant, construction engineer, Friant-Kern Canal Distribution System, Central Valley Project, Calif. Dexheimer acted as chairman of the conference's session on general contract administration problems.

New appointments

D. S. Martin, planning engineer, New Orleans, La.
John P. Larsen, Rochester Dist., N. Y. State Public Works Dept.
E. T. Plantz, Milwaukee, Wis., expressway engineer
Roger Walker, Maine Military Defense Committee
F. G. Snyder, Pueblo, Colo. dist. irrigation engineer

Retirements

Tom Davis, U. S. Bureau of Public Roads, Oregon, 31 years.
L. L. Lyford, asst. to chief engineer Illinois Central R.R., 47 years.
Cyril C. Train, engineer in the military construction office of the chief of Army Engineers, and **P. E. Borchers,** engineering chief of the water supply unit in the repair and utilities div.
W. M. Neptune, engineering dept. Missouri Pacific R. R., 45 years
J. H. Dowling, supt. of sewer maintenance, Dayton, Ohio, July 1, 43 years.
Miss Oliva W. Dennis, research engineer, Baltimore & Ohio R.R.
Col. L. R. Hathaway, Springfield, Mass., Corps of Engineers, 35 years.

Resignations

Carl H. Carroll, city hall engineer, Newport, R. I., to join Grove International, Casablanca, Africa
Octave Ammon, engineer, Div. 6, Ohio highway dept. to go with the Red Eagle Corp.
S. A. Baker, asst. to chief engineer, Michigan State Highway Dept. to be secretary, Michigan Asphalt Paving Assn.
H. G. Porak, city engineer, Olympia, Wash.
Roy Mohler and **C. R. Alkire,** engineer, bureau of structures, Dayton, Ohio, to go into private work.
V. B. Krug, city engineer So. Pasadena, Calif., to go into private work.

Municipal and county

J. A. List, dir. water dept., Niagara Falls, N. Y.
G. H. Williams, city engineer, Olympia, Wash.
G. A. Peterman, city engineer, Fostoria, Ohio

Industrial and commercial

E. L. Snyder, asst. to chief engineer, Illinois Central R.R.
R. P. Hart, chief operating officer, Missouri Pacific R.R.
W. H. White, consulting groundwater hydrologist at 307 W. 12th St., Austin 1, Tex.
Norman De Wind, Jr., chief engineer, Southern State Iron Roofing Co., Savannah, Ga.
W. M. Bird, engineer and supt. of instruction, Leaders Construction Co., Sioux Falls, S. D.
Carl C. Walker, president and chief Engineer, Jennings-Lawrence Co., Columbus, Ohio
R. C. Mason and **L. T. Johnston** have established Mason-Johnson & Associates, consulting engineers, 9915 Garland Road, Dallas, Tex.
John H. Goshorn, dist. engineer, Asphalt Institute, Cincinnati, Ohio
Wm. E. Johnson, asst. general mgr., General Electric Co., Hanford Works, Hanford, Wash.
Gordon Mitchell, project mgr., Ontario Hydro Electric Commission, Niagara Falls, Ont.; A. Richardson, general superintendent, and Wm. Fraser, resident engineer.
Wm. Denny, assistant to Ralph E. DeSimone, exec. vice-pres. and general mgr., Merritt-Chapman & Corp., New York.
W. N. Downey, bridge engineer, Nashville, Chattanooga & St. Louis Ry.
R. G. Kraft, supt. of real estate, Massachusetts Mutual Life Ins. Co.
A. C. Danks, bridge engineer, Union R.R. Co., Pittsburgh, Pa.
Bernard E. Lashbough, director of project development, Associated Construction Co., Hartford, Conn.
L. MacIsaac industrial engineer, Canadian National Railways, Moncton, N. B.
Thomas H. Childers, vice-president, H. H. Via, Inc., Santa Fe, N. M.
Wm. R. Powrie, managing engineer of Twin Cities office of Walter H. Knapp, Inc., railroad builders and consultants.
John E. Bernhardt, chief engineer, Wm. J. Howard, Inc., Chicago.
Walter J. Ryan, civil engineer, consultant to the industrial bureau, Chamber of Commerce, Tacoma, Wash.

Stifel W. Jens has opened an office as a consulting engineer at 101 South Meramec Avenue, St. Louis 5, Mo., with emphasis on hydrologic, hydraulic, and sanitary engineering. For the last 18 years, latterly as a partner, he has been with the St. Louis firm of Horner & Shifrin. Last year he was chairman of the ASCE Committee on Hydrology. As a member of that committee for the prior 4 years, Mr. Jens had an important part in the preparation of the hydrology manual published by ASCE in 1949.

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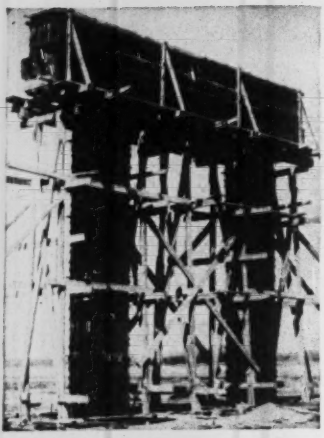

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EDUCATION, RESEARCH

HEAVILY LOADED TRUCK rolls across newly built California freeway structure as strain and deflection data are recorded. Load on the rear axle is 54,000 lb.

Full-scale tests in California may lead to—

More economical bridge design

Tests are now under way on a California freeway bridge structure to determine stresses actually produced by various loads. Results when fully analyzed should give a better picture of how structures behave and, thus, lead to more economical design.

The project is in essence a cooperative effort between the University of California Institute of Transportation and Traffic Engineering, the California Division of Highways, and the U. S. Bureau of Public Roads. It is being conducted by the institute with guidance provided by an advisory committee composed of representatives of the three cooperating agencies as well as by consulting engineers.

• **Common type used**—The San Leandro Creek Bridge under construction by the California Division of Highways on the Eastshore Freeway in Oakland, Calif., was chosen for the study. It is a common type of bridge structure composed of a reinforced concrete deck supported by three longitudinal steel girders. There are 23 spans about 63 ft long each. Two typical spans were chosen for testing.

Principal objectives of the tests are to investigate: (1) composite action of the concrete slab with the steel girders and (2) effect of the slab and of steel diaphragms on the pattern of load distribution between girders. So far the data seem to indicate that composite action is accomplished.

In conjunction with these objectives observations are also being made to determine: (1) the magnitude of the moments in the steel columns due to lateral and longitudinal forces, (2) distribution of stress in the concrete slab, and (3) dynamic behavior of the structure.

• **Heavy instrumentation**—Literally hundreds of gages were installed during construction in the two spans under test. These include: 211 SR-4 electric strain gages, 16 Carlson strain meters, 91 Whittemore lines and 8 induction-type deflectometers. Some of these are bonded to structural steel, others are embedded in concrete.

The gages are wired to a central instrument shed where all of them were read for static load tests. Strains produced by moving loads were recorded in a specially designed trailer by use of oscillographic equipment.

In conjunction with measurements of strain and deflection, the U. S. Coast & Geodetic Survey has measured the vibration of the structure. Lateral, longitudinal and vertical natural frequencies were determined.

A heavy loaded truck was used for the initial series of tests. This was placed in various positions for static load tests and run over selected routes for moving load tests. Positions were selected to produce maximum stresses in various parts of the structure. Measurements were made for the following conditions: (1) dead load of structure, (2) live load in static positions, (3) live load moving over various routes at about 2 mph, and (4) live load moving over various routes at 15 mph.

The truck was loaded with steel in-

gots and sand to a total weight of about 70,000 lb. Load on the rear axle was 54,000 lb. This is obviously far in excess of loads usually allowed on such structures. However, such a load was believed necessary to produce measurable data on the various gages.

• **Control specimens made**—While the bridge was under construction, control specimens were made so measured strains could later be translated to actual stresses. Steel test bars were cut from the steel girder stock and also from the reinforcing bar stock to determine modulus of elasticity of these materials. Besides this, concrete test beams and cylinders were made and tested at different periods.

Many months will be required to analyze the data fully. In the meantime, additional tests with other sorts of moving loads will be made.

Work on the project is under the direction of Robert Horonjeff and Prof. T. Y. Lin of the institute staff.

Besides Horonjeff and Lin, the advisory committee includes H. R. Angwin and R. Archibald of the Bureau of Public Roads; H. E. Davis and R. A. Moyer of the Institute of Transportation and Traffic Engineering; H. D. Eberhart, University of California; Stewart Mitchell and T. E. Stanton of the California Division of Highways; N. A. Raab, California Division of Bay Toll Crossings and G. B. Woodruff, San Francisco consulting engineer.

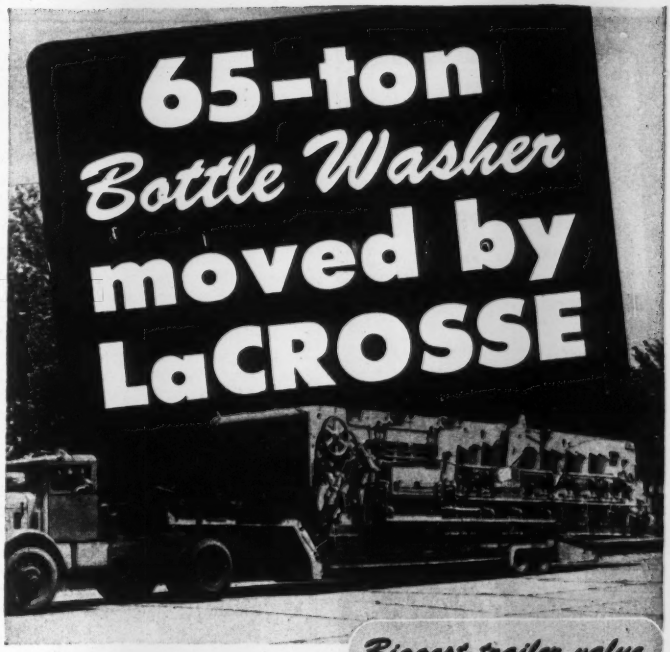
50th anniversary

On April 27 there will be celebrated at Syracuse University the 50th anniversary of the founding of the Lyman Cornelius Smith College of Applied Science.

Faculty Notes

Prof. Henry Campbell has been named head of the department of civil engineering at Rhode Island State College, Kingston, succeeding Prof. Arthur A. Collard, who joined the faculty in 1947 and will now be connected with the engineering firm of Knappen, Tibbetts Abbett Engineering Co., New York City. Prof. Campbell is a graduate of the Harvard Graduate School of Engineering and was an engineer in the Massachusetts Department of Public Health before serving with the U. S. Army in the second world war.

Paul E. Klopsteg, director of research at Northwestern University's Technological Institute, has accepted an invitation to assist the University of Punjab, Lahore, Pakistan, in modernizing and expanding its science and engineering departments.



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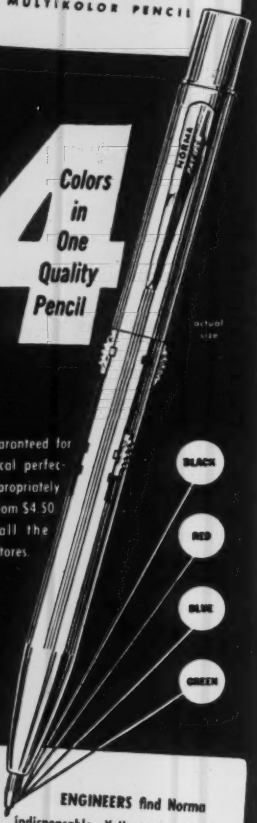

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MEETINGS

J. Norman Pease of Charlotte has been elected president of the North Carolina Section of ASCE. Carroll L. Mann, Jr., of Greensboro, and P. D. Davis of Durham were named vice-presidents, and Edward B. Rice, Raleigh, secretary-treasurer.

C. E. Dobbin has been elected president of the Colorado Society of Engineers. Other new officers are: Terry J. Owen, vice-president, and C. M. Lightburn, re-elected secretary-treasurer. Members of the board of managers are: Fred Blair; A. J. Ryan; C. E. Dahlquist; J. S. Rasmusson; R. F. Blanks; William H. Killey, and Ray Schrodt.

Ross H. Reynolds of Raleigh has been elected president of the North Carolina Society of Engineers, H. E. Hicks vice-president and Leroy M. Keever renamed secretary-treasurer. New directors are: L. C. Kerr, George B. Cherry, Worth Baldwin and Mallory K. Cannon, Jr.

The American Institute of Consulting Engineers, at its recent annual meeting in N. Y. City elected E. P. Goodrich, president; Scott Turner will serve as vice-president; George C. Diehl as treasurer and Elmer K. Timby, secretary. The retiring officers are Leslie G. Holleran, E. P. Goodrich, George C. Diehl, and R. E. Bakenhus.

Alvin L. Aubinoe has been elected 1951 president of the Home Builders Association of Metropolitan Washington, D. C. Other officers, Russell B. Martin, first vice-president and J. Garrett Beitzell, second vice-president.

An $8 billion cut in the amount of new construction in the United States this year as compared with 1950 was forecast by A. N. Carter, speaking at the recent annual convention of the Associated General Contractors of Iowa. "It appears likely total new construction this year will drop to $20 billion," said Carter, who is manager of the highway contractors' division of the national group.

The Ft. Worth Chapter of Texas Society of Professional Engineers has installed these new officers: W. H. Sindt, president; John J. Burgess, vice-president; J. Matt Walker, 2nd vice-president; Forrest L. Park, secretary, and Robert W. Crook, treasurer.

Officers of the new Kentucky Highway 10 to 40 Club are: President, M. W. Tinder; vice-president, Roy Campbell; and W. W. Alcoke, treasurer. Members of the organization are employees of the department with more than 10 years of service. The oldest employee at the organization meeting was D. Locke Lyons, London, Ky., with 33 years of service.

Prof. Sydney F. Duncan of the University of Southern California has been elected chairman of the Pacific Southwest section of the American Society for Engineering Education, succeeding Dean Everett D. Howe of the University of California at Berkeley. Prof. C. E. Cherry of the College of Marin was elected vice-chairman, succeeding Duncan. Prof. J. B. Franzini, Stanford University, was elected secretary-treasurer, succeeding Robert G. Moses, Pasadena City College.

Van Porter Enloe has been elected president of the Georgia Engineering Society, succeeding Burton J. Bell of the U. S. Army Engineers. Other officers: First vice-president, C. E. Drummond; second vice-president, Warren S. Mann; secretary, George Normandy; and treasurer, John L. Underwood.

CALENDAR

California Sewage Works Assn., Hotel California, Fresno, Calif., April 25-28.

Pacific N. W. Conference, ASCE, Multnomah Hotel, Portland, Ore., April 27-28.

American Society of Civil Engineers, Pacific Northwest Conference, Multnomah Hotel, Portland, Ore., April 27-28.

American Water Works Association, annual conference, Miami, Fla., April 29-May 4.

Materials Handling Exposition and Conference, International Amphitheater, Chicago, Ill., April 30-May 4.

California Sections American Society of Civil Engineers, The Ahwahnee, Yosemite National Park, Calif., May 3-5.

N. Y. State Society of Professional Engineers, Silver Anniversary, Hotel Statler, N. Y. City, May 10-12.

Building Officials Conference of America, King Edward Hotel, Toronto, Ont., May 14-17.

Society for Experimental Stress Analysis, spring meeting, Wardman Park Hotel, Washington, D. C., May 16-18.

Pacific Northwest Sewage Works Assn., Hotel Vancouver, Vancouver, B. C., May 17-19.

Pacific Northwest Section, AWWA, Hotel Vancouver, Vancouver, B. C., May 17-19.

Pennsylvania Society of Professional Engineers, Americus Hotel, Allentown, Pa., May 18-19.

Canadian Section, AWWA, Royal Alexandra Hotel, Winnipeg, Man., May 21-23.

New England and New York Sewage Works Associations, spring meeting, Hotel Kimball, Springfield, Mass., June 7-8.

President's Highway Safety Conference, Washington, D. C., week of June 10.

National Society of Professional Engineers, annual meeting, Nicollet Hotel, Minneapolis, Minn., June 13-16.

OBITUARY

Lawrence W. Ellis, 77, a civil engineer, died in Veedersburg, Ind., on March 25. He lived at Kansas City, Kan., for 57 years, where he was assistant city engineer until he retired 10 years ago.

Richard W. Wolfe, 84, former commissioner of public works, Chicago, who began the straightening of the Chicago River, built a water filtering plant and was active in obtaining a city water filter system for Chicago, died March 30. He served on the Lake-to-Gulf Deep Waterways Commission. Its work resulted in the appropriation of more than $300,000,000 for flood control along the Mississippi River.

J. W. Tillman, 91, died in Centralia, Ill., on March 28. He founded a construction company in March, 1908, which has carried on continuously, and is now known as G. E. Tillman Co., Inc. of Centralia.

Harry Deyoe Mc Glashan, 72, retired San Francisco District Engineer of the Water Resources Branch, U. S. Geological Survey, died March 26 in San Francisco. Well known in the hydraulic engineering field, Mc Glashan had served with the San Francisco Water Resources Branch from 1906 until his retirement two years ago. He was a graduate of Syracuse University in 1906.

Frederick Mordhorst, Sr., N. Y. state highway engineer, died March 26 at Utica. He began his career with the Board of Transportation of New York City. In 1929 he moved to Utica and was employed by the New York State Department of Highways as a senior engineer aide.

Albert P. Maris, 65, a civil engineer employed by the Northern Pacific Railway Co. at Seattle, Wash., died there March 26. A graduate of Washington State College, he worked for railway companies at Seattle from 1914 to 1926, when he joined the Corps of Engineers. Maris directed flood-control work on the Missouri and Ohio rivers and defense projects in the Southern states before returning to Seattle three years ago. He had since been in charge of relocation for the Northern Pacific R.R. in eastern Washington.

Robert E. Myers, 43, vice-president of the Myers-Keller and Byers Co., civil engineers, died March 24 in St. Louis, Mo.

Howard C. Means, 75, died March 20 at Salt Lake City, Utah, after a career on many western engineering projects. He was chief engineer of the Utah State Road Commission during the 20's, supervising the construction of the Mt. Carmel Highway in Zion National Park, and the construction of the US 40 cutoff across the Wendover section of Utah's salt desert. He did engineering work on the irrigation systems on the Crow and Cheyenne reservations in Montana, the Shoshone reservation in Wyoming, and the Uintah reservation in Utah, and later worked for cement companies.

Harry P. Croft, 60, former chief of the Bureau of Public Health Engineering in the New Jersey Department of Health, died in Trenton, N. J., March 28. He started with the State Health Department in 1913 following his graduation from Lehigh University. In 1918 he was made chief of the Bureau of Public Health Engineering, a position he held until his retirement last Jan. 1. During his career he sponsored many of the present New Jersey laws for the control of water supplies and pollution, the development of the Delaware River basin and the protection of surf bathing waters along the Atlantic Coast.

James Hopkins Hill, 81, civil engineer and retired supply officer and superintendent of the Smithsonian Institution Building, died April 2 in Washington, D. C. He retired from the Smithsonian in 1946 after 37 years. Mr. Hill was graduated from Spring Hill College in Alabama as a civil engineer and went to Washington in 1891. He supervised the laying of tracks for the old Chesapeake Beach Railway. From 1902 to 1909 he worked for a Washington Construction firm and in 1909 joined the Smithsonian. One of his duties as supply officer was to equip the Smithsonian's scientific expeditions.

Harry D. Appleby, 80, retired construction engineer, and Veterans Administration project manager, died April 2 in Takoma Park, Md. He was in charge of construction, designing and supervision of veterans' hospitals until his retirement 10 years ago. He joined the Veterans Bureau, predecessor of the VA, shortly after World War I, when he went to Washington for the Navy Department. He formerly was head of the Bureau of Design and Survey in New York City where he helped design one of the first tunnels under the East River.

Julius Flato, 85, Chicago contractor

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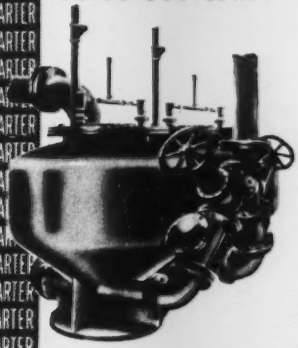

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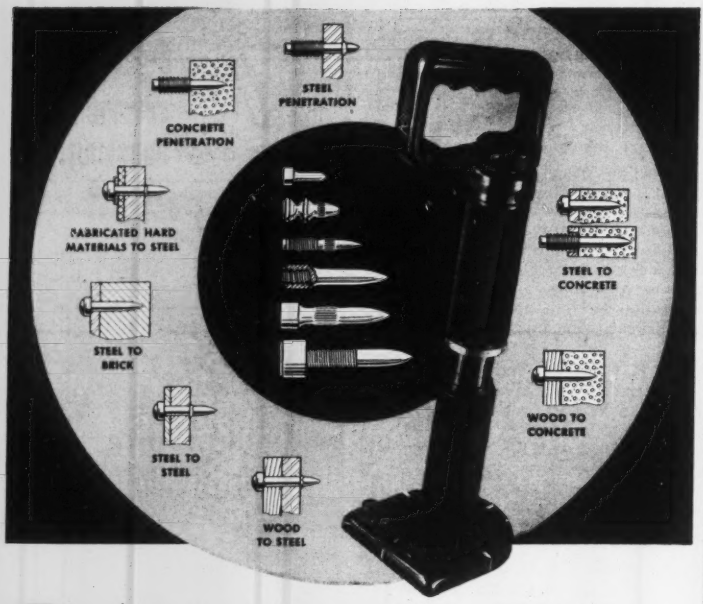

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and structural engineer for 50 years, died in Manchester, N. H., March 30.

Robert C. Johnson, Sr., 73, formerly maintenance of way engineer for the N. Y. City Board of Transportation, died in Elizabeth, N. J., April 3. A graduate of the Western University of Pennsylvania, until 1902 he was with the N. Y. Central Railroad as director of maintenance of the electrified zone. He was in charge of the installation of the signal system and telephone engineering and construction of the Independent Rapid Transit system of N. Y. City between 1927 and 1932, after which he was in charge of maintenance of structures, trucks, line equipment.

Harry F. Vogt, 68, died at Shaker Heights, Ohio, April 3. A graduate of Pratt Institute, his earlier work was as a representative in Cleveland of the Riverside Bridge Co. In 1923, with K. L. Conant he formed Vogt and Conant, which has done steel erection work for many large plants in the Cleveland area.

Henry Clay James Jr., 62, president of the James Construction Co. of Seattle, Wash. and St. Paul, Minn., died April 1 at Butte, Mont. A graduate of the University of Minnesota College of Engineering 1910, he was a construction engineer with the Northern Pacific Railway before moving to Seattle five years ago. He was in charge of construction of the spillway at Fort Peck Dam and various flood-control projects. In 1943 he supervised his firm's work in construction of the Hanford, Wash., atom bomb plant. At the time of his death, he was engaged in the installation of switchyards at Davis Dam in Arizona.

Arthur T. Safford, 83, former chief engineer of the Locks & Canals Co., Lowell, Mass., died there April 3. He was a graduate of Williams College and was with the company over 50 years. Earlier he was on the engineering staff of the Metropolitan District Water Supply Commission, Boston, and later was president of the Boston Society of Civil Engineers. During World War I he was New England engineer for the Federal Fuel Conservation Agency.

Alexander S. MacKey, 69, consulting engineer of Ottawa, Ont., died there April 1.

Edward Hawks Ravenscroft, 79, chairman emeritus of Abbott Laboratories, North Chicago, Ill., died March 31 in Phoenix, Ariz. He was graduated from the University of Michigan and joined Abbott in 1908 as a contracting engineer.

UNIT PRICES BID BY CONTRACTORS

Hungry Horse Dam and Power Plant in Montana—Part II

The following schedule is a continuation of last week's unit price article concerning the construction on the completion of Hungry Horse Dam and Power Plant located on the South Fork of the Flathead River, approximately 9 miles southeast of Columbia Falls, Montana.

(Continued from ENR 4/12/51, page. 80)

Items,	Quantity	Unit Prices 1c	2
Install:			
15,000 volt power cable from generator bus to station service transform in pp	lf 800	$2.21	$2.00
Insul elect cable in pp, 600 volt, No. 19 25 AWG, single conduct	lf 4,000	0.13	0.09
3 conductor	lf 6,000	0.21	0.12
5 cond	lf 8,000	0.354	0.16
7 cond in dam, pp, ap work	lf 5,900	0.505	0.20
Insul armored elec cab in dam, ap work, 600 vl, No. 19 25 AWG, 7 cond	lf 1,800	0.655	0.30
Insul elect cable in pp, 600 vl, No. 19 25 AWG, 9 cd	lf 3,000	0.53	0.40
12 cond	lf 5,000	0.66	0.50
15 cd in pp, d&ap	lf 4,800	0.73	0.50
No. 19 22, 3 cd	lf 1,500	0.21	0.20
5 conduct	lf 2,000	0.35	0.20
7 cd in pp, d&ap	lf 1,300	0.50	0.30
7 cd, armored cable in d & ap	lf 250	0.69	0.40
9 conductor	lf 1,000	0.53	0.40
No. 19 25, arm cab in dam, ap work, 15 cd	lf 450	0.78	0.50
Insul elect cable in pp, 600 vl, stranded, No. 12 AWG, 3 cond	lf 6,000	0.20	0.20
No. 10, 3 cd	lf 1,500	0.21	0.20
No. 8, 2 cd, in d&ap	lf 400	0.165	0.20
No. 8, 3 cd	lf 500	0.234	0.20
No. 6, 3 cd	lf 1,500	0.30	0.20
No. 4, 3 cd in d. pp, ap wk	lf 5,000	0.391	0.20
No. 2, 3 cd	lf 500	0.435	0.40
Insul jacket el cab in d&ap wk, 5,000 vl, No. 1/0 AWG, 3 cd	lf 450	1.85	0.40
Amor elec cable	lf 850	3.30	0.40
In el cab for drain heat, single cond	lf 2,250	0.386	0.40
IEC, No. 2 0 AWG, sing cd, 600 vl, in duct bank from mhs EYB-EYC	lf 135	0.25	0.40
Remove IEC from temp bypass cab route, 1-cd No. 2 0 AWG 600 vl	lf 540	0.125	0.40
No. 1 0	lf 1,650	0.11	0.40
IEC in duct bank from mh EYB to EYC, 1-cd No. 1 0 AWG 609 vl	lf 405	0.24	0.40
IEC in pp, No. 16 AWG 600 vl:			
3 cd, in pp, d&ap wk	lf 1,300	0.186	0.30
5 conductor	lf 500	0.252	0.30
7 cond	lf 1,000	0.34	0.30
9 conductor	lf 500	0.426	0.30
12 cond	lf 500	0.53	0.30
15 cond	lf 500	0.57	0.30
37 cond	lf 1,200	0.78	0.40
IEC in duct bank from mh EYB to EYC, No. 19 25 AWG 600 vl:			
5 cond	lf 135	0.36	0.20
7 conductor	lf 135	0.50	0.30
12 cond	lf 270	0.58	0.30
3cd No. 19 22	lf 270	0.25	0.17
9 cd No. 19 22	lf 135	0.53	0.50
Remove IEC from temp bypass cable route, No. 19 25 AWG 600 vl, 5 cd	lf 540	0.11	0.20
7 conductor	lf 500	0.11	0.30
12 cond	lf 1,000	0.114	0.30
3 cd No. 19 22	lf 1,000	0.114	0.10
9 cd No. 19, 22	lf 540	0.114	0.30
Generator bus struct in pp., install & test	ls	30,668	12,500
Circuit breaker, potential transf in pp	ls	14,681	12,500
Gen neut grnd eq in pp.	ls	6,531	10,000
On transf deck of pp:			
Gov't camp unit substation	ls	2,930	5,000
Oil circuit breaker 115 kilov	lb 55,000	0.078	0.14
Deice power transf	lb 17,000	0.042	0.10
On take-off struct:			
Disconnct switch, 196 kilovl	lb 30,000	0.09	0.13
115 kv	lb 16,500	0.105	0.13
196 kv light arrester	lb 27,000	0.088	0.15
400 amp wave trap	lb 1,000	0.10	0.50
1–15 kv deice bus, discnt grnd switch	lb 450	0.30	0.55
15 kv current transf in neut circ of 115, 230 kv pow transf	lb 740	0.355	1.00
115 kv coupl capacitor	lb 3,000	0.23	0.20
1" iron-pipe-size copper tubing, conn, fitt for bus, f	lb 1,400	5.05	3.00
1¼"	lb 3,450	3.67	3.00
Cable for high volt bus f	lf 400	12.65	6.00
No. 4 0 AWG bare strand cop cable for high volt bus, f	lf 665	13.85	3.00
Power transf	lb 1,487,000	0.0153	0.02
Coupling capac pot device adj unt in cab spread room of pp	lb 300	0.39	1.00
Main control board CCA in perm loc	lb 12,000	0.105	0.16
Record board CCB	lb 6,000	0.105	0.20
Line relay bd CCC in perm posit	lb 10,000	0.104	0.22
Unit cont bd C1A-C4A,	lb 12,000	0.104	0.20
In temp location:			
Main cont bd CCA	lb 12,000	0.076	0.20
Line relay bd CCC	lb 5,000	0.076	0.22
Annunciater rel cabint CCD	lb 2,000	0.076	0.22
Battery cont bd CSA & 2 motor generat	lb 2,500	0.170	0.22
Annun cab CSB, CCD in perm locat	lb 3,000	0.17	0.22
1–60 cell station stor battery	lb 10,000	0.167	0.20
3 double-end stat-service unit substation	lb 166,500	0.04	0.15
1 heat pow un sub-st	lb 13,000	0.08	0.20
Heat, power control center MSA through MSF, M1A-M4A, NSA, NSB, NSF NCB, N4A	lb 25,050	0.47	0.20
Direct curnt power distrib bd BSA, BSB	lb 2,250	0.47	0.30
Main light, heat distrib panel L1A-L4A, NSC	lb 1,100	0.49	0.22
CO2 control cabint	lb 1,000	0.48	0.22
Drain heat control panel NSD, NSE	lb 400	0.64	0.35
2 Sump pump float switches	lb 300	0.81	0.30
Lab test panel	lb 1,000	0.47	0.35
Misc elect equip	lb 1,000	0.45	1.00
Heat, light distrib transformer K2D, K2E, K3D, K3E, KCB	lb 6,700	0.10	0.35
Machine shop bus duct	lb 5,100	0.53	0.40
Mac shop crane runway conduct	lb 5,200	0.53	0.30
Make grnd connect to equip, metalwk, mach install in pp by others	ea 150	11.65	8.00
Bare strand sing-conduct copper grnd cable, Buried No. 4 0 AWG, adj to duct bank from mnhole EYB to EYC, f&i	lf 270	0.96	2.00
No. 4 0 AWG, from temp bypass cab route betwn manholes, remove	lf 270	0.11	0.30
Incand light fix in d&ap	ea 70	8.20	7.00
In parapet of dam	ea 60	13.73	10.00
In dam & ap work:			
Fleur light fixture	ea 70	17.63	10.00
Elect distrib panel, auto trnsfer switch	lb 3,600	0.35	0.35
Dry-typ distrib transformer	lb 1,700	0.42	0.35
Motr control cabinet	lb 300	0.85	0.30
Misc metalwk for mount elect distrib equip	lb 2,500	0.46	0.40
Transformer, 2,400 vl light, power distrib in dam transf vault	lb 11,000	0.075	0.20
Crane trolley cond system in valve house	ls	271.00	2,000
In power plant:			
Incan light fix, +flood light	ea 800	12.95	7.00
Fleur light fix, 48" long	ea 57	15.80	10.00
72"	ea 94	19.60	10.00
96"	ea 138	23.60	15.00
Finish light panel bd, main lgt dist panel, CO2 cont cabinet recesses	ea 33	52.55	15.00
Flush-typ lgt panel bd in conc recess	ea 26	25.20	200.00
Surf-typ lgt panel bd	ea 1	69.00	200.00
Angle-iron p bd support for lgt p bd in conc recess	ea 52	25.25	5.00
Paint to generat, f	sf 20,000	0.253	0.30
To control rm ceil & wall	sf 3,000	0.151	0.12
To outlet pipe & bellmouth casting	sf 52,500	0.76	0.55

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CONSTRUCTION REPORTS

Bids Asked—Low Bidders—Contracts Awarded

Compiled by Business News Department—Engineering News-Record, 330 W. 42nd St., New York 18, N. Y.

ELSIE EAVES, Manager — *J. A. MAHONEY, Reports* — *M. R. ROESSLER, Statistics*

NEW ENGLAND

BIDS ASKED—BUILDINGS

Mass., Chelsea—NURSES HOME—B. A. 4/24—State, State House, Boston, nurses home at Soldiers' Home. Plans deposit $20, **Perry,** Shaw & Hepburn, 31 St. James Ave., Boston, and Kehoe & Dean, 953 Park Square Bldg., Boston, archts. CD 2/20/50.

Conn., Plainville—SCHOOL—B. A. 5/1—Supt. Schools, Bd. Educ., High School, East St., Plainville Elementary School off Farmington Ave. and Cottage St., Plans deposit $25. CD 12/15/49.

Conn., Hartford—HOME FOR AGED—B. A. 5/3—City, Municipal Bldg., home for aged persons, 2 Holcomb St. Plans deposit $50. CD 7/21/49.

LOW BIDDERS—HEAVY CONSTRUCTION

Paul Bacco & Son, Inc., 758 Summer St., Stamford, Conn. Low Bidder. **$562,000.** trunk line sanitary sewers, STAMFORD, CONN. City Purch. Agt., City Hall, Stamford, Conn. Bids Mar. 27. CD 3/1.

CONTRACTS—BUILDINGS

Walter L. Ritchie Co., 1 Salem St., Malden, Mass. Contract Awarded. **$674,310.** Central Elementary SCHOOL, Bartlett St.; **$363,506,** West Andover Elementary SCHOOL, Beacon St., ANDOVER, MASS. Town Supt. Schools, Andover, Mass. Awarded Mar. 28. CD 3/26 under LB.

Arthur Oman & Sons, Inc., 485 Essex St., Weymouth, Mass. Owner Builds. Approx. **$700,000.** 55 ranch type HOMES on 40 acre development, South St. section, Braintree Highlands, BRAINTREE, MASS.

▲ **M. Spinelli & Sons Co., Inc.,** 79 Milk St., Boston, Mass. Contract Awarded. **$2,966,940.** HOUSING Proj. 200-6, Rindge Ave. Exten., North Cambridge, CAMBRIDGE, MASS. City of Cambridge Housing Auth., 51 Inman St., Cambridge, Mass. Awarded Mar. 28. CD 3/12, under LB.

▲ **Daniel Cunningham Constr. Co.,** 20 Kilby St., Boston, Mass. Contract Awarded. **$1,369,985.** MATERNITY and PEDIATRIC Bldg., at HOSPITAL, Varnum Ave., LOWELL, MASS. Lowell General Hospital, 295 Varnum Ave., Lowell, Mass. Awarded Mar. 30. CD 3/28, under LB.

▲ **Wadhams & May Co.,** 15 Lewis St., Hartford, Conn. Contract Awarded. **$1,371,700,** Louise Duffy SCHOOL, WEST HARTFORD, CONN. Town Bd. Educ., Memorial Rd., West Hartford, Conn. Bids Mar. 9, awarded Mar. 26. CD 3/15, under LB.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION

New York—B.A. 4/27—President Queens Boro, 120-55 Queens Blvd., Kew Gardens, 15, N. Y., sanitary sewers, 26 and 27 Aves.; 25 Rd., 125, 126 and 128 Sts., Cross Island Parkway; storm sewer 27 Ave., storm trunk sewer, appurtenances in Cross Island Parkway, across park land from a temporary outlet in prolongation of Utopia Parkway at point about 80 ft. south of northerly property line of Cryders Lane to service roadway of Cross Island Parkway, etc.; combined sewer appurtenances in permanent easement to be acquired in 245 St., from Rushmore Ave. to point approx. 100 ft. southerly thereof, then in 245 St. from this point to Thornhill Ave. with temporary connections across Rushmore Ave. at 245 St. and Van Zandt Ave., etc.; 166, 160, 26 and Murray Sts. 17, 21, 27 and 29 Aves., Willets Point Blvd.; high level sewer Willets Point Blvd. CD 10/20/48.

BIDS ASKED—BUILDINGS

N. Y., Astoria—HOUSING IMPRVS.—B.A. 4/25—New York City Housing Auth., 63 Park Row, New York, Zone 12, topsoil and planting for Astoria Houses (Proj. No. NYS-24) comprising Sect. II, in Queens Boro, in area bounded generally by Astoria Ave., 1st St., 27 Ave., 8 St. and the contract limit line to south of the project as shown on the drawings. Plans deposit $25. CD 4/18/46.

Md., Patuxent River—HOUSING—B.A. 5/1—Pub. Wks. Office, Potomac River Naval Command, Naval Gun Factory, Wash., D. C., construct, manage and finance, 1,000 unit private rental housing Proj. N-06, Sects. 1, 2, 3, and 4. Navy Title VIII, at Naval Air Station and Naval Air Test Center. CD 2/10/50.

SOON LETS CONTRACT—BUILDINGS

N. J., Laurel Springs—SCHOOL—Camden, N. J. Catholic Diocese, 721 Cooper St., soon lets contract school, addns., alterations. $525,000. Thomas Henry Moran, Princeton, archt. CD 4/2.

Pa., Easton—ENGINEERING—Lafayette College, Easton, soon lets contract engineering bldg. $600,000. Donald F. Innes, 68 W. 58 St., New York, N. Y., archt.

LOW BIDDERS—HEAVY CONSTRUCTION

South Shore Contr. & Dredging Co., 100 West Ave., Patchogue, N. Y. Low Bidder. **$138,650.** sewage disposal plant, alterations, Hammond Ave., PATCHOGUE, N. Y. Village Office, 14 Baker St., Patchogue, N. Y. Bids Feb. 19. CD 2/15.

G. A. & F. C. Wagman, Inc., Dallstown, Pa. Low Bidder. **$85,678.** retaining wall, south bank of Juniata River at State Institution for Defective Delinquents, HUNTINGDON, PA. Dept. Property & Supplies, 1400 N. 9 St., Harrisburg, Pa. Morris Knolwes, Inc., 1312 Park Bldg., Pittsburgh, 22, Pa., engr. Bids April 4.

Charles V. Keesey, 167 N. 10 St., Lebanon, Pa. Low Bidder. **$73,565.** mechanical constr.***Lancaster Electric Supply Co.,** 285 N. Queens St., Lancaster, Pa., **$153,000,** electrical work for electrical distr. sys. and other utilities at Millersville State Teachers College, MILLERSVILLE, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Apr. 4. CD 3/30.

Leo Butler Co., 8416 Georgia Ave., Silver Spring Md. Low Bidder. **$230,297.** Contr. 906 S, approx. 4,050 ft. 36 in. concrete pressure pipe; 3,610 ft. 42 in. RCCP and RCCPX sewers, Grape St. Relief Sewer, HYATTSVILLE, MD. Washington Suburban Sanitary Comn., Hamilton St., Hyattsville, Md. Bids Apr. 2. CD 3/26.

National Capitol Parks, Interior Bldg., 18 and C Sts., Wash., 25, D. C., received no bids Apr. 3, grading, constr. access walks for bath and shelter house and rehabilitation, swimming pool deck at Georgetown and Rosedale Playgrounds, Contrs. Nos. 128np-1544, 1-28np-1545, WASH., D. C. New bids 4/10. CD 3/28.

LOW BIDDERS—BUILDINGS

S. H. Evert Co., Danville Rd., Bloomsburg, Pa. Low Bidder. **$498,697.** general constr. completion Buckout (Biological) LABORATORY, at Pennsylvania State college, STATE COLLEGE, PA. General State Auth., 18 and Herr Sts., Harrisburg, Pa. Bids Apr. 4. CD 3/14.

Collins & Maxwell, Easton, Pa. Low Bidder. **$297,202.** construct highway MAINTENANCE BLDG., STROUDSBURG, PA. State Dept. Dpt. Property & Supplies, 1400 N. 9 St. Harrisburg, Pa. Bids Apr. 4. CD 3/20.

J. H. Williams Co., 1122 Cathedral St., Baltimore, Md. Low Bidder. **$312,000.** 1 story, brick, stone, concrete block branch LIBRARY, Penna and North Aves., BALTIMORE, MD. City Bureau Bldg. Constr., 410 Municipal Bldg., Baltimore, Md. Smith & Veale, 2127 N. Charles St., Baltimore, Md., archts. CD 1/27/44.

Morrow Bros., Inc., 2315 N. Charles St., Baltimore, Md. Low Bidder. **$515,200.** 3 story, bsmnt., 48x145 ft., brick, limestone, steel, rein.-con. Levindale INFIRMARY, BALTIMORE, MD. Associated Jewish Charities, Monument and Eutaw Sts., Baltimore, Md. Bids Apr. 3. CD 3/20.

CONTRACTS—BUILDINGS

▲ **Irving Dimson,** 131 E. 17 St., New York 3, N. Y. Contract Awarded. **$10,000,000.** 19 six story APARTMENTS, on site bounded by Northern Blvd., 34 Ave., 90 and 94 Sts., JACKSON HEIGHTS, N. Y. Broadmoor Apartments, c/o contractor. Kavy & Kavovitt, 44 Court St., Brooklyn 2, N. Y. archts.

PROJECTS COVERED

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterways $34,000; other public works $60,000; industrial buildings $82,000; other buildings $300,000.

Classes of Construction

(Name in order of Listing)

Water Supply	Latin America
Sewers, Waste Disposal	Public Buildings
Bridges	Commercial Buildings
Streets & Roads	Industrial Buildings
Earthwork, Waterways	Unclassified

Stages Reported

PROPOSED WORK: Including appointment of engineers or architects.

BIDS ASKED (new announcements only). For full calendar, see also preceding issues of ENR.

LOW BIDDERS: On jobs below $500,000 value all low bidder news will be the final reports published on the projects involved except where award is not made to the low bidder. In this case, a supplementary contract award report will be published.

CONTRACTS AWARDED: Except awards to low bidders previously reported in low bidder stage.

Dates shown are of issue in which last previous report was published.

Symbols and Abbreviations Include:

†	Federal Government
▲	Project of $1,000,000 or over.
B.A.	Bids Asked
ENR	Engineering News-Record
CD	Engineering News-Record Construction Daily

Lauter Constr. Co., 112 S. 16 St., Phila., Pa. Contract Awarded. **$400,000.** 1 story, 23x312x332 ft., concrete, steel, masonry MFG. PLANT, on 24 acre plot area, North Point Rd., BALTIMORE, MD. Kieckhefer Container Corp., 130 N. Broadway, Camden, N. J. CD 4/4.

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION

† **S. C., Charleston**—MINECRAFT BASE—B.A. 4/25—Officer in Charge of Construction, P. O. 365, Naval Base, Charleston, rehabilitation Minecraft Base at Charleston Naval Base, NOY 23961, Spec. 26275. Plans deposit $10.

La., Tallulah—B.A. 4/27—Madison Parish Police Jury, 1,976 cu. yd. structural excav., 140 lin. ft. 42 in. asph. covered corrugated pipe. Extended date. CD 3/30.

† **Fla., Panama City**—DOCKS, etc.—B.A. 5/1—U. S. Naval Base, Charleston, S. C., rehabilitation of docks and constr. new bulkheads at Navy Mine Countermeasures Station. Plans deposit $10.

† **Kentucky**—B.A. 5/8—U. S. Eng., 830 W. Broadway, Louisville, Zone 3, 2 pump. plants with concrete substructures, brick superstructure walls and concrete roof deck, monolithic and pipe sewers, sluice gates, flapgates and tide gates, 7 storm water pumps, 5 sewage pumps electrical control equip., transformer sub-stations, 4 and Buchanan St., CIVENG 15-029-51-124. Plans deposit $15. CD 1/12.

SOON LETS CONTRACT—BUILDINGS

Va., South Boston—HOSPITAL—Halifax County Community Hospital Assn., South Boston, soon lets contract construct Halifax County Community Hospital, near here. $750,000. Extended date. CD 2/23.

LOW BIDDERS—HEAVY CONSTRUCTION

J. Kennon Perrin Co., 5 and Cary Sts., Richmond, Va. Low Bidder, **$86,336.** relining Byrd Bark Reservoir, RICHMOND, VA. City, City Hall, Richmond, Va. Bids Apr. 2.

Red River Constr. Co., 2212 Hollywood Ave., Shreveport, La. Low Bidder. **$529,384.** sewer and water imprvs., BOSSIER CITY, LA. Town, Bossier City, La. Bids Mar. 31. CD 3/20 under Water Supply and Sewers.

LOW BIDDERS—BUILDINGS

▲ **Irons & Reynolds, Inc.,** 1724 H. St. N.W., Wash. D. C., Low Bidder, **$913,777,** HIGH SCHOOL for white pupils; **$408,777,** Negro HIGH SCHOOL addn; **$1,298,777,** combined bid on both jobs.*** **Lucas Constr. Co.,** Fredericksburg, Va., **$389,600,** on Negro High School, FREDERICKSBURG, VA., City School Bd., Fredericksburg, Va. CD 3/9 and CD 2/21.

Sparling Constr. Co., Greensboro, N. C., Low Bidder **$352,000.** 3 SCHOOLS, NASHVILLE, N. C. Nash County Bd. Educ., L. S. Inscoe, supt., Nashville, N. C. Harry J. Harles, Rocky Mount, N. C., archt. Bids Mar. 27.

† **Pub. Wks. Office,** Box 365, Naval Base, Charleston, S. C. will not convert Bldg. 21 into paint SHOP, NOY 22824. Spec. 25340, CHARLESTON, S. C. Project cancelled. CD 1/5.

CONTRACTS—HEAVY CONSTRUCTION

† **Norfolk Dredging Co.,** P. O. Box 486, Norfolk, Va. Contract Awarded, **$378,750.** dredging and removal of piers, U. S. Naval Amphibious Base, Little Creek, Contr. No. NOY-24884, NORFOLK, VA. Fifth Naval Dist., Norfolk, 11, Va.

▲† **Bowe Contg. Co., Inc. and T. E. Ritter Corp.,** 426 W. York St., Norfolk, Va. Contract Awarded, **$7,290,912.** imprvs., exten. to airport pavements, Naval Auxiliary Air Station, Contr. NOY-24561, OCEANA, VA. Pub. Wks. Office, Fifth Naval Dist., Norfolk, Zone 11, Va. CD 2/15.

CONTRACTS—BUILDINGS

Southeastern Builders, Inc., 1755 Longwood Rd., Jacksonville, Fla. Contract Awarded. **$756,000.** 204 family HOMES on 50 acre tract at 11 Ave. N. and 5 St. JACKSONVILLE BEACH, FLA. Ernest F. Shad & E. R. Jones, Jacksonville Beach, Fla.

MIDDLE WEST

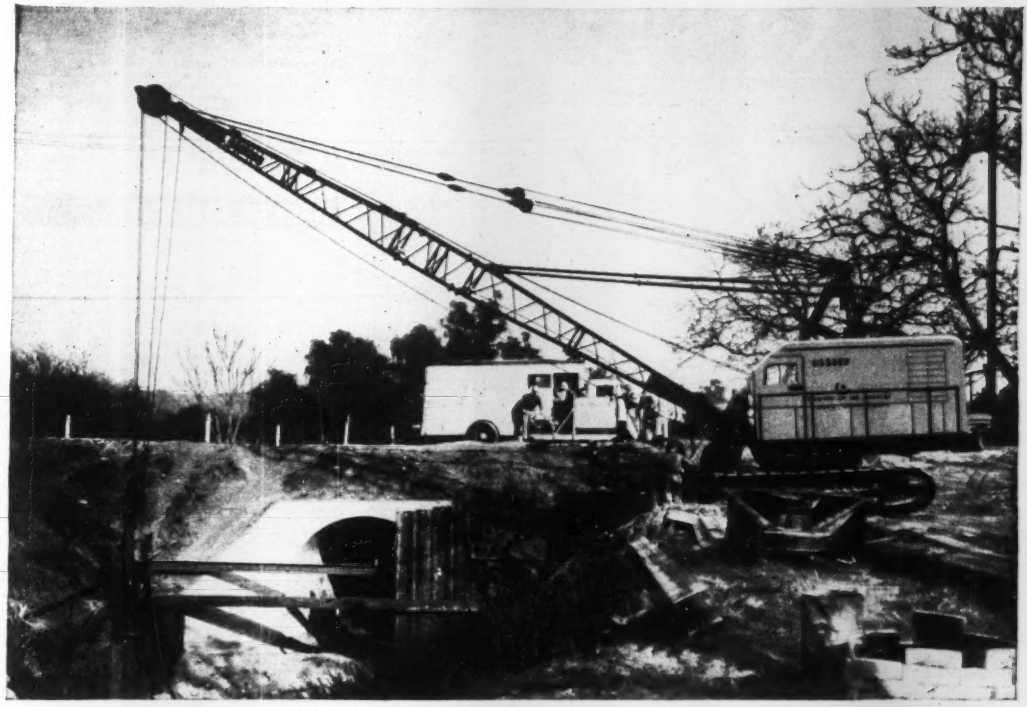
LOW BIDDERS—BUILDINGS

▲† **Montgomery Constr. Co.,** 803 W. Main St., Grove City, Pa. Low Bidder, **$1,895,000.** Wardwell Yards facilities, WAREHOUSES, WARREN, O. General Services Admin., Pub. Bldgs. Service, General Services Bldg., 19 and F Sts., N. W. Wash. 25, D. C. Bids Mar. 27. CD 3/9.

CONTRACTS—BUILDINGS

Rust Constr. Co., P. O. Box 695, Evansville, Ind. Contract Awarded, Approx. **$300,000,** 1 story, 125x275 ft., brick, concrete, structural steel WAREHOUSE, EVANSVILLE, IND. Orr Iron Co., Sam Orr, pres., 1100 Pennsylvania St., Evansville Ind. Awarded Mar. 29.

Struck Constr. Co., 147 N. Clay St., Louisville, Ky. Contract Awarded, Approx. **$550,000,** 1 story, 89x140



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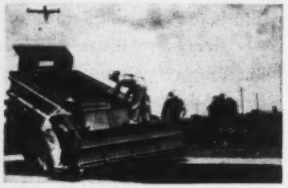

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ft. library and 3 story, 34x152 ft., brick, stone, rein.-con. president's residence, HANOVER, IND. Hanover College, Hanover, Ind. Awarded Mar. 27. McGuire & Shook, 1400-01 Fletcher Trust Bldg., Indianapolis, Ind., archts.

Carl Geupel Constr. Co., 1919 N. Meridian St., Indianapolis 2, Ind. Contract Awarded. Approx. $270,000, design and construct 1 and 2 story, 120x289 ft., brick, concrete, structural steel WAREHOUSE, NOBLESVILLE, IND. Firestone Tire & Rubber Co., 1200 Firestone Parkway, Akron, O. CD 11/15.

H. M. Wolfe & Co., Nameoki, Ill. Contract Awarded, general constr. $323,491, brick, concrete high SCHOOL addn., LITCHFIELD, ILL. Bd. Educ., Litchfield, Ill. Bids Mar. 7. CD 2/20.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION

Ia., Runnels—B. A. 4/24—City, WW sys. $40,000.

† **Minn., New London**—FISH REARING PONDS—B. A. 4/24—Fish & Wildlife Service, Dpt. Interior, 1006 W. Lake St., Minneapolis, fish rearing ponds at Fish and Wildlife Service, Fish Cultural Station.

BIDS ASKED—BUILDINGS

▲ **Tex., Brownsville**—POWER PLANT—B. A. 5/7—City, power plant, general constr., Approx. $1,500,000; (a) furnishing, erecting tanks, breeching and stack at municipal power plant, (b), power plant pipe sys. $275,000; furnishing, installing complete electrical sys. and power plant wiring for municipal power plant. $200,000. Plans deposit $25 each. Black & Veatch, 4706 Broadway, Kansas City 2, Mo., engrs. CD 12/18.

SOON LETS CONTRACT—HEAVY CONSTRUCTION

† **Nebraska**—SUB-STATION—Loup River Public Power Dist., Columbus, soon lets contract construct entirely new sub-station, incl. grading, building, walks, utilities also bay for incoming lines, step-down transformer, tie from transformer to kv bus, switching facilities, transformer bank, in Columbus. P. E. Hampton, c/o owner, ch. engr. CD 9/1/49.

SOON LETS CONTRACT—BUILDINGS

Tex., Denton—EDUCATIONAL—First Presbyterian Church, Denton, soon lets contract educational. $300,000. Wilbur Kent, 404 Perry St., Lufkin, engr. and archt.

Tex., Fort Worth—SHOPPING CENTER—Fair Oaks building, Inc., 819 Penn St., soon lets contract shopping center, 4401 Hy. 183. $400,000. W. G. Clarkson & Co., 819 Penn St., Fort Worth, archt. CD 3/27.

Tex., Fort Worth—WAREHOUSE—Texas Bag & Burlap Co., 1315 Bell Ave., soon lets contract masonry warehouse addn. concrete slab fdn. $90,000. L. Gabert & Wm. J. Wisdom, 1315 Bell Ave., Houston, archts.

▲ **Tex., Randolph Field (San Antonio)**—HOUSING—Murchison Bros., 1315 Pacific St., Dallas, (sponsors), soon lets contract 600 housing units. $5,000,000. Walter Alschlager, 212 S. St. Paul St., Dallas, archt. R. Marvin Shipman, 146 W. Olmos Dr., engr. CD 4/3.

LOW BIDDERS—HEAVY CONSTRUCTION

L. S. Mayfield & Son, Taylor, Tex. Low Bidder. $67,125. 36 in. water main, W. 35 St. to Reservoir, AUSTIN, TEX. City, City Hall, Austin, Tex. Wm. Parker, city planner, c/o owner. Bids Dec. 12, awarded Mar. 28.

Stuckley Constr. Co., Wichita Falls, Tex. Low Bidder. $85,672. c. conc. paving certain streets, CANADIAN, TEX. City, Canadian, Tex. W. E. Neill, Borger, Tex., engr. Bids Mar. 27. CD 3/13.

† **H. E. Beall**, Gatesville, Tex. Low Bidder. $993,531. operations bldg., control tower, fire and crash station, Gray Air Force Base, Inv. No. Eng 41-243-51-52; Fort Hood, KILLEEN, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids March 30. CD 3/9.

† **H. J. Von Rosenberg**, 330 Melrose Pl., San Antonio, Tex. Low Bidder. $99,666. control bldg., facilities for set, Inv. No. Eng 41-243-51-53, at Kelly Air Force Base, SAN ANTONIO, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Mar. 30. CD 3/14.

Peter Kiewit Sons Co., 1950 S. Colorado Blvd., Denver, Colo. Low Bidder. $84,739, grading, structure, stabilization and oil processed surf. 4.632 mi. State Hy. 59 between Yuma and Haxtun, Colo. Proj. S 0007 (1), Yuma Co., COLORADO. State Hy. Dpt., 518 State Office Bldg., Denver, Colo. Bids Apr. 3. CD 3/27.

G. L. Tarlton Contg. Co., W. Park at Manchester St., St. Louis, Mo. Low Bidder. $248,770, est. $260,473. lining 3 tunnels, 0.515 mi. State Hy. 20 in Clear Creek Canon between Golden and Forks, Colo. Proj. F 005-3 (8), Jefferson Co. COLORADO. State Hy. Dpt., 518 State Office Bldg., Denver, Colo. Bids Mar. 21. CD 3/15.

LOW BIDDERS—BUILDINGS

L. V. Jambers Constr. Co., Laredo, Tex. Low Bidder. $89,900, est. $85,000. WAREHOUSE, BROWNSVILLE, TEX. A. Pascuel & Bros., Laredo, Tex. CD 3/23.

CONTRACTS—HEAVY CONSTRUCTION

Park Ward Co., 711 N. W. 38 St., Oklahoma City 6, Okla. Contract Awarded, $131,572, est. $131,601, asph. stabil. base, single bit. surf. 6.541 mi. Hy. 15, east of Texas line, Ellis Co.; **Broce Constr. Co.**, Woodward, Okla., $75,553, est. $80,734, grading, drainage 12.139 mi. State Hy. 34 northeast of Hammon, Custer Co., OKLAHOMA, State Hy. Dpt., Capitol, Oklahoma City 5, Okla. Bids Apr. 3, Awarded Apr. 4. CD 3/28.

City, Beaumont, Tex., Purchase and Hire. **$90,000.** sanitary sewer unit, BEAUMONT, TEX. Clyde Black, city engr., George Schaumberg, American Natl. Bank Bldg., Beaumont, Tex., engr. CD 6/26/47.

City, Beaumont, Tex. Purchase and Hire. **$85,000.** opening, imprv. street thoroughfare, BEAUMONT, TEX. Clyde Black, city engr.

City, Bellaire, Tex. Own Forces. **$100,000.** storm sewer unit, BELLAIRE, TEX. J. E. Noser, c/o owner, engr. CD 11/15.

City, Bellaire, Tex. Own Forces. **$65,000.** street imprvs. and addns. asph. paving, BELLAIRE, TEX. J. E. Noser, c/o owner, engr.

City, Denton, Tex. Purchase and Hire. **$95,000.** storm sewer unit, DENTON, TEX. Joe E. Ward, Nacol Bldg., Wichita Falls, Tex., engr. CD 10/24/46.

City, Denton, Tex. Purchase and Hire. **$70,000.** outside lighting sys. extens., imprvs. DENTON, TEX. Joe E. Ward, Nacol Bldg., Wichita Falls, Tex., engr. CD 10/24/46.

City, Waco, Tex. Own Forces. **$40,000.** connecting water lines in pump. station area; **$115,000,** concrete water main unit leading to underground reservoir, WACO, TEX. Joe J. Rady, 811 American Fidelity Bldg., Fort Worth, Tex., engr. CD 7/23/48.

City, Wichita Falls, Tex. Purchase and Hire. **$90,000.** storm sewer unit, WICHITA FALLS, TEX. F. M. Rugeley, city engr. CD 12/14/49.

City, Wichita Falls, Tex. Purchase and Hire. **$125,000.** addnl. street imprvs. and asph. paving, WICHITA FALLS, TEX. F. M. Rugeley, city engr. CD 2/14/49.

CONTRACTS—BUILDINGS

Abild Constr. Co., 2709 S. W. 12 St., Des Moines, Ia., Contract Awarded. **$95,000,** WAREHOUSE, DES MOINES, IA. Acri Wholesale Grocery Co., 1800 S. W. 2 St., Des Moines, Ia.

Robinson Constr. Co., 5540 West Park, St. Louis 10, Mo. Contract Awarded. 1 story, 110x150 ft., brick, concrete WAREHOUSE, 4100 North Union Blvd., ST. LOUIS, MO. David R. Nieman, 7559 Byron Pl., St. Louis 5, Mo. W. P. Neil Co., 4814 Loma Vista St., Los Angeles, Calif., lessee.

International Shoe Co., 1509 Washington Ave., St. Louis 3, Mo. Separate Contracts. 1 story, 64x100 ft., brick, concrete SHOE FACTORY addn., 2125 Hickory St., ST. LOUIS, MO. Herbet Reinhart, 1820 Cherokee St., St. Louis 18, Mo., archt.

W. C. Harting Constr. Co., 722 Chestnut St., St. Louis 1, Mo. Contract Awarded. reconstr. 2 story WAREHOUSE and distribution station, 1167-69 Hodiamont Ave., ST. LOUIS, MO. Sloan Co., 5119 Delmar Blvd., St. Louis 8, Mo. Fred R. Nauman, 714 N. Woodlawn St., Kirkwood, St. Louis 22, Mo., archt.

O'Rourke Constr. Co., Box 5384, Dallas, Tex. Contract Awarded, **$258,100,** est. $250,000. WAREHOUSE, DALLAS, TEX. Grinnell Co., Inc., 1316 Marilla St., Dallas, Tex. Bids Mar. 16, awarded Apr. 2. CD 3/8.

Cooley Lumber Co., 2401 E. E. Lancaster St., Fort Worth, Tex. Contract Awarded, **$718,396.** 100 DWELLING units for total 30 bldgs., 2 administration bldgs., site development utilities, DENISON, TEX. Denison Housing Auth., Denison, Tex. Bids Mar. 29, awarded Apr. 4. CD 4/4, under LB.

† **Olson Constr. Co.,** 535 Railway Exchange Bldg., Denver, Colo. Contract Awarded, **$812,000,** repairs, alterations portion of HOSPITAL BLDGS. for specialized treatment, CAMP CARSON, COLO. Dpt. Army, Lt. Col. Floyd E. Styner, Camp Carson, Colo. Bids Mar. 6, awarded Mar. 21. CD 3/16, under LB.

FAR WEST

BIDS ASKED—BUILDINGS

Ore., LaGrande—HIGH SCHOOL—B.A. 4/27—School Dist. 1, LaGrande, first unit, 9 rooms of rein.-con. high school. Plans deposit $25. Freeman, Hayslip & Tuft, 2040 S. W. 3rd St., Portland, archts.

† **Utah, Tooele**—BUILDINGS—B.A. About 5/8—U. S. Eng., 10 West 1st South St., Salt Lake City, 10 bldgs. "D" area, incl. decontamination center; field operations bldg.; medical test laboratory; munitions storage; explosive igloos; munitions cold storage; plant growing bldg.; warehouse; post exposure bldg.; chemical laboratory, Inv. No. ENG 04-203-51-1069. Plans deposit $35; 7 bldgs. in "C" area, incl. munitions assembly bldg.; surveillance bldg.; office and change house; warehouse, paint and repair shop; cold transfer and hoist station; defusing station; open transfer shed, Inv. No. Eng 04-203-51-1070, all above Dugway Proving Ground. Plans deposit $30.

† **Utah, Tooele**—BUILDINGS—B.A. About 5/15—U. S. Eng., 10 West 1st South St., Salt Lake City, 10 buildings in "E" area, incl. commissary; post exchange; service station; enlisted men's club; guard house; school; chapel; hospital; nurses' quarters; attendants' dormitory, Dugway Proving Ground, Inv. No. Eng 04-203-51-1074. Plans deposit $50.

LOW BIDDERS—HEAVY CONSTRUCTION

T. L. Gustafson, 1700 E. Campbell Ave., Phoenix, Ariz., Low Bidder, $82,621, wid.'n repaving 5 mi. Mesa-Casa Grande runnis hy., Pinal Co.; W. J. Henson, 115 S. Granite St., Prescott, Ariz., $234,873, building 10 mi. new alignment Kingman-Topok sector, U. S. 66, Mohave Co. ARIZONA State Hy. Dpt., 17 Ave. and Jackson St., Phoenix, Ariz.

† **Viking Automatic Sprinkler Co.,** 1120 8 Ave. S. Seattle, Wash. Low Bidder. **$791,072,** est. $726,653 automatic sprinkler systems in 9 warehouses at Auburn General Depot, Serial No. ENG 45-108-51-131, AUBURN, WASH. U. S. Eng., 4735 E. Marginal Way, Seattle, 4, Wash. Bids Apr. 3. CD 3/26.

LOW BIDDERS—BUILDINGS

D. A. Norton & Sons, 4400 N. Central Ave., Phoenix, Ariz., Low Bidder, **$346,872,** administration and per-

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George R. Lewis Co., 2036 Queen Ave. S., Minneapolis 2, Minn.
B. H. Mueller Co., 6823 Delmar Blvd., St. Louis 5, Mo.
Olo K. Olsen Co., 823 Perdido St., New Orleans, La.
Philip D. Barnard, 2036 Addison, Houston 5, Tex.
Western Steel Prod. Co., 1755 W. 13th Ave., Denver 4, Colo.

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W. C. Smith of California, Inc., 2119 Pacific Ave., Long Beach, Calif. Low Bidder. **$454,000.** George Washington Carver Elementary SCHOOL, LONG BEACH, CALIF. Long Beach City School Dist., 715 Locust Ave., Long Beach, Calif. Bids Mar. 30. CD 3/19.

▲ **Bein Constr. Co.,** 139 South Beverly Dr., Beverly Hills, Calif. Low Bidder, **$1,359,900,** steel frame elementary and intermediate SCHOOL, RIVERA, CALIF. Rivera School Dist., 8910 E. Slauson Ave., Rivera, Calif. Bids Apr. 4. CD 3/14.

CONTRACTS—HEAVY CONSTRUCTION

† **Electric Constr. Co.,** 1650 Center St., Tacoma, Wash. Contract Awarded. **$894,388.** construct 230 kv Big Eddy-Goldendale-Midway Line, Inv. 5619, OREGON and WASHINGTON. Bonneville Power Admin., 827 N. E. Oregon St., Portland, Ore. Bids Mar. 2, awarded Mar. 14. CD 3/6, under LB.

Ramsey Constr. Co., Corvallis, Ore. Contract Awarded. **$65,263.** construct 7,100 ft. 8- to 36-in. sewer, ROSEBURG, ORE. City, City Hall, Roseburg, Ore. Arthur Boyer, c/o owner, City engr. Bids Apr. 2.

▲† **Peter Kiewit Sons,** 345 Kirkways Ave., Arcadia, Calif. Contract Awarded. **$2,219,922,** est. $2,000,000. Los Angeles River Imprvt., Imperial Hy. to Pacific Electric Railway Bridge, Los Angeles, Los Angeles Co., CIVENG 04-355-51-20, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 15, awarded Mar. 30. CD 3/21, under LB.

† **R. P. Shea Co.,** Box 218, Indio, Calif. Contract Awarded. **$581,200,** est. $500,000. San Diego River and Mission Bay Imprvt., San Diego, CIVENG 04-353-51-22, CALIFORNIA. U. S. Eng., 751 S. Figueroa St., Los Angeles, Calif. Bids Mar. 20, awarded Apr. 2. CD 3/27, under LB.

▲ **Bechtel Corp.,** Mills Tower, San Francisco, Calif. Contract Awarded. **$2,000,000.** salvage 43-miles 8 in. pipe line to Mojave desert and relay in vicinity of San Ardo, Monterey Co., CALIFORNIA. General Petroleum Corp., 612 S. Flower St., Los Angeles, Calif. Awarded Apr. 3.

De Fonce Constr., Inc., 110 Colonial Ave., Bridgeport, Conn. Contract Awarded. **$949,110.** Contr. 1, rehabilitation sedimentation tank, Contr. 2, sewage treatment plant addns., alterations, NORWALK, CALIF. City, P. Wks. Dpt., City Hall, Norwalk, Calif. Bids Mar. 13, awarded Mar. 30. CD 3/23, under LB.

CONTRACTS—BUILDING

C. H. Elle Constr. Co., P. O. Box 1010, Pocatello, and Reynolds & Walker, Box 363, Twin Falls, Idaho. Contract Awarded. **$605,162.** HOSPITAL, JEROME, IDAHO. Jerome Hospital Assn. Inc., Jerome, Idaho. Bids Mar. 1. CD 3/8, under LB.

Austin Co., 2930 4th Ave. S., Seattle, Wash., Contract Awarded. **$750,000.** 2 story, 134x160 ft., concrete addn. to wood pulp PLANT, SALEM, ORE. Oregon Pulp & Paper Co., Salem, Ore. Karl Heinlein, Salem, Ore., engr. Awarded Mar. 28.

Brummett Demblon, Inc., 210 S. Garfield St., Monterey Park, Calif. Owner Builds. **$516,800.** 76 frame, stucco DWELLINGS in Tract 16302, BALDWIN PARK, CALIF. Nelson Rice, 354 S. Spring St., Los Angeles, Calif., archt. CD 5/4.

John E. Branagh & Son, 105 Sheridan Ave., Piedmont, Calif. Contract Awarded **$555,730.** gymnasium, cafeteria, etc. at Willard Junior High SCHOOL, BERKELEY, CALIF. Bd. Educ., Berkeley Rose and Walnut Sts., Berkeley, Calif. Bids Mar. 15, awarded Mar. 29. CD 3/21, under LB.

John A. Alexander, 2620 Zoe Ave., Huntington Park, Calif. Contract Awarded. **$97,000.** rein.-con. CANNERY, EAST LOS ANGELES, CALIF. Kern Food Products, 2850 E. Pico St., Los Angeles, Calif.

Dick Bldg. Co., 1305 S. Atlantic Blvd., Los Angeles, Calif. Contract Awarded. **$100,000.** reinforced brick WAREHOUSE, LOS ANGELES, CALIF. D. M. O'Brien, 2155 E. 5 St., Los Angeles, Calif. CD 2/26.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

† **Alaska**—ADMINISTRATION BLDGS.—B. A. 5/10—Civil Aeronautics Admin., Anchorage, 2 story, 50,000 sq. ft. administration bldg. at Anchorage Airport and 1 story, 20,000 sq. ft. administration bldg. at Fairbanks Airport, Inv. No. 851-564. Plans deposit $150. CD 8/6/48.

BIDS ASKED—BUILDINGS

† **Alaska, Fort Richardson**—SHOP, ORDNANCE—B.A. —4/26—U. S. Eng., New Washington Hotel, Seattle 1, Wash., field maintenance shop, ordnance, Inv. No. S95-507-51-90. Plans deposit $50. CD 3/14.

▲ † **Alaska, Fort Richardson**—SHOPS—B.A. 4/27—U. S. Eng., New Washington Hotel, Seattle 1, Wash., engineer, quartermaster, signal repair, combined and freight equipment shops, Inv. S95-507-51-70. $2,-000,000. Plans deposit $100. Young & Richardson, Carleton & Detlie, Central Bldg., Seattle 4, Wash., archts. CD 11/27.

† **Alaska, Anchorage**—SHOP—B. A. 4/30—The Alaska Railroad, Dpt. Interior, Anchorage, Alaska, 115x280 ft. steel frame general repair shop. $500,000. Plans deposit $25. CD 3/14.

CONTRACTS—BUILDINGS

Valle-Sommers Constr. Co., 407 3 Ave. W., Seattle, Wash. Contract Awarded, **$578,294.** SCHOOL, JUNEAU, ALASKA. Independent School Dist., Juneau, Alaska. Bids Mar. 27. CD 4/3, under LB.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

▲ **Ont., Ottawa**—B.A. 5/1—Bd. Control, City, fabrication, supply, delivery and jointing steel pipe and specials for 42 and 48 in. water mains, and for 42 and 48 in. steel cylinder, concrete, pipe and specials, etc. also for 42 and 48 in. steel pipe, specials and coupling with coal tar enamel protective coating for water mains for Scott St. to Carlington Heights Reservoir $275,000. Total est. Approx. $1,600,000. W. E. Macdonald, c/o owner, engr.

CONTRACTS—HEAVY CONSTRUCTION

Grant Mills Ltd., 5314 York Ave., Montreal, Que., Contract Awarded, **$80,000.** Canal Lock 4 addn., at Cote St. Paul, MONTREAL, QUE. Govt. of Canada, Hunter Bldg., Ottawa, Ont.

Desourdy Constr. Ltd., 143 North St., Cowansville, Que. Contract Awarded, Approx. **$400,000,** 2 story, 60x294 ft., T-shaped, combined mess with wing, 60x150 ft., rein.-con. at R.C.A.F. Station, St. HUBERT, QUE. Defence Constr. Ltd., 1247 Guy St., Montreal, Que. Bids Mar. 13. CD 2/27, under Public Buildings.

CONTRACTS—BUILDINGS

Souisby & Law, 21 Verbena Ave., Swansea, Ont. Own Forces. Approx. **$300,000** two addnl. **APARTMENTS,** in Anglesay Blvd., Etobicoke, incl. 3 story 44 suites, steel frame, brick, ETOBICOKE (TORONTO), ONT. Hanks & Irwin, 2848 Bloor St. W., Toronto, Ont., archts.

▲ **L. de G. Belley,** 255 Racine St., Chicoutimi, Que. Owner Builds. **$2,500,000.** three hundred 2 story 24x30 ft. concrete, wood frame DWELLINGS, RIVIERE DU MOULIN, (Postal Dist. Chicoutimi), QUE. CD 3/28.

LATIN AMERICA

CONTRACTS—BUILDINGS

Koppers Co., Koppers Bldg., Pittsburgh, Pa. U. S. A. Contract Awarded, design and construct blast FURNACE and CHEMICAL COKE OVENS, VOLTA REDONDA, BRAZIL, Brazilian National Steel Co., Volta Redonda, Brazil. CD 9/17/41, under CA.

PROPOSED PROJECTS

WATER SUPPLY

▲ **Mo., Kansas City**—City, Pub. Wks., City Hall, Zone 6, voted bonds Mar. 27, water main to Ford Motor Co. plant at Ravina, **$650,000;** water mains to strengthen existing sys. in annexed area, $500,000; feeder mains, fire hydrants in Clay Co. annexed area, $230,000; imprvs. at pumping station and water treatment plant, $300,000. CD 1/23.

▲ **N. C., Asheville**—City, City Hall, bond election May 8, 5,700,000 gal. reservoir in North Fork Watershed. $2,750,000. CD 7/11.

N. C., Haw River—Town, water distr. sys. **$210,000.**

▲ **N. C., Shelby**—City, voted bonds Mar. 31, exten., imprv. City Water Supply Plant. **$1,139,000.**

▲ **Tex., Gladewater**—City, 617 acres just purchased for construction lake and earthen dam for domestic water supply, dam will be 900 ft. earthen, 200 ft. concrete service spillway and 250 ft. emergency spillway. $1,000,000.

Tex., Laredo—City, Proj. 1, water supply and elevated steel tank storage, **$450,000;** Proj. 2, water treatment plant, $550,000; Proj. 3, c.i. water mains, distr. lines, $600,000; Proj. 4, WW sys., general rehabilitation, $380,000. Myers, Noyes & Assoc., Nixon Bldg., Corpus Christi, and Sigler, Clark & Winston, Box 428, Weslaco, consult. engrs. CD 4/4.

SEWERS, WASTE DISPOSAL

Calif., Midway City—Midway City Sanitation Dist., Midway City, sanitary sewer collection sys. to serve Midway City, Westminster and Barber City, **$675,000.** J. R. Lester Boyle, 691 Coast Blvd., Laguna Beach, consult. engr.

▲ **Pa., Leetsdale**—Sewickley Valley Auth., Leetsdale, sewage disposal plant and sewers for Boro's of Sewickley, Ley, Leetsdale, Edgeworth and Glen Osborne. $1,000,000. Morris Knowles, 1312 Park Bldg., Pittsburgh, engr. CD 11/1/45.

Wash., Bryn Mawr—Bryn Mawr-Lakeridge Sewer Dist., Bryn Mawr, voted bonds sewerage sys. **$547,500.** General Eng. Co., Central Bldg., Seattle, Zone 4, consult. engr.

BRIDGES

▲ **Arkansas**—State Hy. Dpt., Little Rock.

Crawford Co.—Alma-Mulberry bridges Hy. 64, **$75,000.**

Cross Co.—St. Francis River Bridge and approaches on Hy. 64, Parkin, $306,000.

Fulton Co.—bridges between Salem and Mammoth Springs, Hy. 9, Salem, $140,000.

Greene Co.—bridge across St. Francis River Hy. 62, McDougall, $100,000.

Hot Springs Co.—overpass on Hy. 270, Malvern, $378,000.

Independence Co.—structures between Locust Grove and Pleasant Grove, Hy. 14, **$124,000.**

Jefferson Co.—side drives on Pine Bluff Bridge, Pine Bluff, $250,000.

Polk Co.—bridges, approaches near Mena, Hy. 8, $160,000.

Pulaski Co.—construct overpass over Rock Island R. R. south of Little Rock, Hy. 167-65, $580,000.

Scott Co.—bridges on Hy. 28 between Rover and Scott Co. line, $150,000.

Washington Co. — bridge, approaches, West Fork, $410,000.

bridge across White River Hy. 68, Fayetteville, $151,000.

▲ **Michigan**—State Hy. Comn., Lansing,

Detroit—rein.-con. overpass Grand River at Detroit Terminal Railroad near Oakman, $500,000.

Detroit-Ferndale—rein.-con. overpass Woodward and 8 Mile Rd. $750,000. Harry C. Coons, State Hy. Dpt., Lansing, ch. engr.

† **Neb., Sidney**—Pub. Roads Admin., Dpt. Commerce, 18 and F Sts. N.W., Wash. 25, D. C. underpass on Eleventh Ave. $721,000.

▲ **New Jersey and Pennsylvania**—Delaware River Joint Toll Bridge Comn., Broad Street Bank Bldg., Trenton, N. J.,

Burlington and Bucks Counties—16-lane toll bridge across Delaware River at Bordentown, N. J., to connect New Jersey and Pennsylvania Turnpikes. $12,000,000

▲ **New Jersey-Pennsylvania** — Pennsylvania Turnpike Comn., 11 N. 4 St., Harrisburg, Pa., and New Jersey Turnpike Authority, 64 Prospect St., Trenton, N. J. bridge over Delaware River south of Bordentown to carry highway linking Pennsylvania and New Jersey Turnpike systems. $12,000,000. May be joint project built by third agency. R. B. Stone, ch. engr.

STREETS AND ROADS

▲ **Arkansas**—State Hy. Dpt., Little Rock,

Benton Co.—pave 4.4 mi. Hy. 100 between Bentonville and Bella Vista, **$209,000.**

Carroll Co.—surf. 12 mi. Hy. 21 east and west, north of Green Forest and Berryville, $194,000.

Clark Co.—wid'n, stabilize hy. 67 from Gurdon 14 mi. north, $730,000.

surf. 9.8 mi. Hy. 84 between Bismarck and Jct. Hy. 270, $127,400.

Cleveland Co.—surf. 14.7 mi. Rison-Pine Bluff Rd., $375,000.

Columbia Co.—pave 13.8 mi. Hy. 82 from Magnolia to Union Co. line, $525,000.

base, resurf. 5 mi. Hy. 98 between Waldo and McNeil, $100,000.

Conway Co.—resurf. Hy. 64 in Morrilton, $50,000.

shoulders, paving 4 mi. east of Morrilton on Hy. 64, $322,000.

shoulders, paving 5 mi. Hy. 64 west of Morrilton, $423,-000.

grading, drainage, grav. 14 mi. Hy. 9 between Center Ridge and Hy. 69, $200,000.

Crawford Co.—pave 6.4 mi. addnl. 2 lane road between Alma and Van Buren Hy. 64, $290,000.

Crittenden Co.—drainage, base unspecified distance west from Hughes, Hys. 149-50, $150,000.

grade, drain 10.7 mi. road between Marion and Turrell, Hy. 61, **$345,600.**

Cross Co.—surf. 9.1 mi. Hy. 1, Vanndale, $102,800.

Dallas Co.—surf. extend. 10 mi. north from Fordyce on Hy. 167, $300,000.

Drew Co.—grading, structures 8.3 mi. Wilmar-Monticello Rd., $255,000.

Faulkner Co.—surf. 4.5 mi. Hy. 64, $70,000.

Franklin Co.—relocate part of Hy. 22, Charleston, $80,-000.

Greene Co.—grading, drainage 8 mi. Hy. 67 west of Corning, $280,000.

Hempstead Co.—grade, drain, surf. 1.5 mi. Hy. 67, west of Hope, $75,000.

pave 10.8 mi. between Hope and Fulton, $418,000.

shoulders, wid'n, stabilization 9 mi. south from Red River, $777,000.

Jefferson Co.—grading base surf. 12 mi. between Cornerstone and Reydell, Hy. 88, $310,000.

grading, drainage 4 mi. Altheimer relocation, $200,000.

Johnson Co.—grading, grav. 5 mi. Hy. 103 north of Clarksville, $40,000.

Lafayette Co.—surf. 14.8 mi. Hy. 29 north and south Bradley, $154,000.

grading, drainage 12.3 mi. Hy. 29 south of Lewisville, $150,000.

Lawrence Co.—10 mi. topping on Hy. 90 between Walnut Ridge and Okean, $120,000.

grading, drainage, structures 12.6 mi. between Hoxie and Alicia, Hy. 67, $500,000.

Locust Bayou—surf. 6.3 mi. Hy. 4 from Locust Bayou to Jct. Hy. 79, $69,960.

Lonoke Co.—grading, surf. 1.75 mi. south of Lonoke Hy. 31, $40,000.

grading, surf. 4 mi. Hy. 38 east from Cabot, $100,000.

grade, drain, widen, stabilize shoulders 11.6 mi. from Lonoke and near Carlisle, Hy. 70, $275,000.

grade, surf. 42 mi. Hy. 67, $200,000.

Madison Co.—grading, base 7 mi. Hy. 23 between Huntsville and Forum, $105,000.

surf. 10 mi. Hy. 16 west of St. Paul, $60,000.

Mississippi Co.—grading, topping 10 mi. Hy. 77 from Manila south to Hy. 40, $180,000.

shoulders, stabilized, surf. 10 mi. Hy. 61 south of Osceola, $500,000.

Montgomery Co.—grading, drainage, base 11.1 mi. Hy 26 between Mt. Ida and Delight, $150,000.

Ouachita Co.—grading, surf. 14 mi. Hy. 24 between and Chidester, $200,000.

Phillips Co.—unspecified work in Elaine Area Hy. 44, $150,000.

grading, drainage 10.5 mi. between Walnut Corner and Marvell Rd., Hy. 20, $370,000.

Poinsett Co.—pave 9.8 mi. Hy. 63 between Marked Trail and Gilmore, $592,740.
Pope Co.—resurf. Hy. 64 in Russellville, $50,000.
surf. 10.6 mi. Hy. 27 between Dover and Hector, $94,480.
c. conc. 1 mi. by-pass Arkansas-Tech Campus on Hy. 7, $75,000.
base, surf. 2 mi. on Hy. 105 south from Atkins, $30,000.
Pulaski Co.—grading, drainage 19 mi. between Little Rock and Benton, Hy. 67 and 70, $825,000.
grading, drainage 16.5 mi. from Little Rock on new location for Hy. 167, $540,000.
Saline Co.—paving, work shoulders 3.3 mi. southwest from Benton, Hy. 67, $276,000.
Scott Co.—grading, base 13 mi. between Forester and Jct. Hy. 71, $150,000.
grading, base, surf. 6 mi. Hy. 14, Waldenburg, $260,000.
Searcy Co.—grading, base 7 mi. north of Marshall on Hy. 27, $105,000.
Sebastian Co.—resurf. widen 5.7 mi. road to Camp Chaffee entrance on Hy. 71, $225,100.
Sevier Co.—surf. 7.9 mi. between Dierks and intersection Hys. 71, $80,000.
Union Co.—surf. 5 mi. Hy. 167 north from El Dorado, $300,000.
resurf. west Hillsboro and North West aves. in El Dorado, Hys. 82 and 167, $50,000.
Van Buren Co.—complete work on 5 mi. Hy. 16 north Clinton, $70,000.
Washington Co.—shoulder stabilization wid'n. surf. 8 mi. Hy. 74, West Fork, $400,000.
grading, drainage 12 mi. from Cedarville north to Washington Co. line, Hy. 59, $150,000.
surf. 10 mi. Hy. 16 to Lake Weddington, Fayetteville, $40,000.
White Co.—grav. base 13.8 mi. between Searcy and Rosebud, Hy. 36, $300,000.
grade, surf. 5 mi. Hy. 67, Searcy, $250,000.
▲ **Quebec**—Dpt. Roads, (Prov. Govt.), Quebec City, **Comeau Bay**—150 mi. highway along lower north shore of St. Lawrence River from Comeau Bay to Seven Islands, Approx. $3,000,000.
New Richmond—60 mi. highway from New Richmond Baie des Chaleurs to Ste. Anne des Monts, Approx. $1,500,000.

EARTHWORK, WATERWAYS

▲ **Ia., Moscow**—First Iowa Hydro Co-operative, Moscow, earthen dam, hydro-electric power plant reservoir, and 4 turbo-generators, $15,000,000. Hubbard Eng. Co., 225 N. Michigan St., Chicago, 1, Ill., engrs. CD 3/21/50.
† **Washington**—U. S. Eng., 4735 E. Marginal Way, Seattle, Zone 4, levee rehabilitation, of 2 sections levee damaged by floods in French Creek Dist. on left bank of Pilchuck River and right bank of Snohomish River and one levee known as Bailey Levee is on left bank of Snohomish River, vicinity of Snohomish, Serial No. CIVENG 45-108-51-49.
▲† **Alaska, Ketchikan**—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, dredging channel to pulp mill site, $1,113,600.
† **Alaska, Sitka**—U. S. Eng., (APO 942, c/o PM, Seattle, Wash.) Anchorage, Alaska, dredging channel through Whitestone Narrows, $176,000; dredging Forest Service Basin, $32,560.

AIRPORTS

▲† **Calif., Fairfield**—FUEL FACILITIES, etc.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., fuel facilities refrigerated storage, hospital facilities, barracks airfield pavements, utilities, freight terminal, and shops, Travis Air Force Base, $9,361,000.
▲† **Calif., Muroc**—TEST FACILITIES—Dpt. Air Force, Pentagon Bldg., Wash., D. C., test facilities, barracks utilities, hospital, communications facilities Edwards Air Force Base, $11,739,000.
▲† **Calif., Riverside**—AIRFIELD PAVEMENTS, etc.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., airfield pavements, fuel facilities communications facilities March Air Force Base, $8,759,000.
▲† **Calif., Sacramento**—DEPOT FACILITIES—Dpt. Air Force, Pentagon Bldg., Wash., D. C., addnl. depot facilities, McClellan Air Force Base, $5,099,000.
† **Calif., San Bernardino**—DEPOT FACILITIES—Dpt. Air Force, Pentagon Bldg., Wash., D. C., addnl. depot facilities, Norton Air Force Base, $800,000.
† **Calif., San Rafael**—AIRFIELD PAVEMENTS, etc.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., airfield pavements, navigational aids, hangar, control tower, communications facilities, utilities, Hamilton Air Force Base, $964,000.
▲† **Calif., Victorville**—HANGARS, etc.—Dpt. Air Force, Pentagon Bldg., Wash., D. C., hangars, fuel facilities, fire station, airfield pavements, navigation aids, communications facilities, utilities, George Air Force Base, $5,192,000.
▲† **Fla., Cocoa**—AIR FIELD IMPRVS.—U. S. Eng., 575 Riverside Ave., Jacksonville, Fla., constr. numerous roads, heavy c. conc. bldgs. and control structures, at Long Range Proving Grounds, $19,541,000; rehabilitating existing buildings, constr. new access roads; water supply system at administration center; new modern storm and sanitary sewerage sys. for Guided Missiles, all at Patrick Air Field, Cape Canaveral near here.
▲† **Ill., Scott Field**—AIR BASE—U. S. Eng., Merchandise Mart, Chicago, Zone 54, plans by Graham, Anderson, Probst & White, 80 E. Jackson St., Chicago, Zone 4, air force base for Air Force, $7,424,000. CD 3/30.

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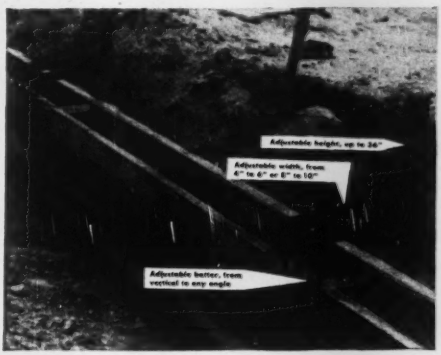

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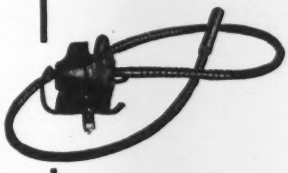

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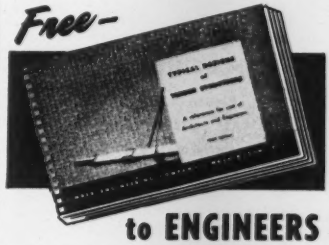

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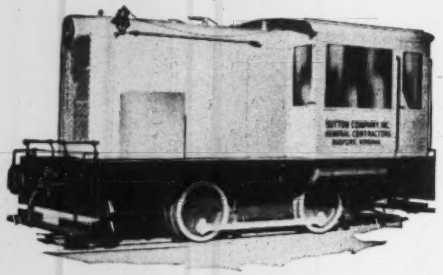

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† **Me., Brunswick**—AIRPORT IMPRVS.—First Naval Dist., 495 Summer St., Boston 10, Mass., runway paving at Naval Air Station, Thompson & Lichtner Co., Inc., 6 Alton Pl., Boston, Mass., consult. engr. and archt. CD 1/18.

† **Me., Brunswick**—AIRPORT IMPRVS.—First Naval Dist., 495 Summer St., Boston 10, Mass., runway paving at Naval Air Station, Thompson & Lichtner Co., Inc., 8 Alton Pl., Boston, Mass., consult. engr. and archt. CD 1/18.

▲† **Me., Brunswick**—AIRPORT IMPRVS.—First Naval Dist., 295 Summer St., Boston 10, Mass., runways, taxiways, aircraft parking at Naval Air Station. Fay, Spofford & Thorndike, 11 Beacon St., Boston, 8, Mass., consult. engrs. and archts. CD 1/18.

† **Mass., Weymouth**—AIRPORT IMPRVS.—First Naval Dist., 495 Summer St., Boston, Zone 10, runway paving at Naval Air Station. Thompson & Lichtner Co., Inc., 8 Alton Pl., Boston, consult. engr. CD 12/28.

† **N. Y., Brooklyn**—RUNWAY—First Naval Dist., 496 Summer St., Boston 10, Mass., plans by Thompson & Lichtner Co., Inc., archt. and consult. engr., 8 Alton Pl., Boston, Mass., runway paving at Floyd Bennett Field.

† **R. I., Quonset Point**—RUNWAY—First Naval Dist., 496 Summer St., Boston 10, Mass., plans by Thompson-Lichtner Co., Inc., archt. and consult. engr., 8 Alton Pl., Boston, Mass., runway at Naval Air Station. CD 12/29.

† **Tex., Amarillo**—MESS HALLS—U. S. Eng., Box 61, Tulsa, Okla., 7 mess halls, Amarillo Air Force Base. $2,250,000. CD 2/2.

LATIN AMERICA

Mexico, Acapulco—Jorge Negrete & Dr. Jose Gaxiola Altamirano, 126, Mexico City, plans medical-surgical clinic. $350,000.

▲ **Mexico, Vera Cruz**—State Tourist Dept., c/o Francisco Broissin, Vera Cruz, plans "Coney Island: similar project, incl. race track, bull ring; yachting and fishing clubs, bowling alleys; allied facilities for outdoor recreation project. $2,500,000.

PUBLIC BUILDINGS

▲ **Calif., Atascadero**—HOSPITAL—State Div. Architecture, P. Wks. Bldg., Sacramento, plans by Albert Criz & Paul R. Williams, 2523 W. 7 St., Los Angeles, State Mental Hospital $8,660,000.

▲ **Calif., Benecia**—WAREHOUSE—U. S. Eng. 74 New Montgomery St., San Francisco, warehouse at Benecia Arsenal, $5,050,000.

▲ **Calif., Palo Alto**—SCHOOL—Palo Alto City Unified School Dist., P. O. Box 149, Palo Alto, voted $4,000,000 bonds, school Clark & Stromquist, 321 Channing Ave., Palo Alto, archt. CD 2/14.

Calif., San Jose—SHOP, etc.—State Div. Architecture, P. Wks. Bldg., Sacramento, shop and laboratory bldg., at San Jose State College. $700,000.

Calif., Yuba City—SCHOOL—Yuba City Union High School Dist., Marion McCart, supt. Yuba City, bond election May 18, school addns. imprvs. $600,000. CD 2/16.

▲† **Colo., Boulder**—LABORATORY—U. S. Atomic Energy Comn., Los Alamos, N. M., special research laboratory on sect. Natl. Bureau Standards Grounds near here, $1,800,000. Sterns-Rogers Mfg. Co., 1720 California St. Denver, Colo., consult. engr. and archt.

Ill., Mascoutah—SCHOOL—School Dist. 10 Bd. Educ., Mascoutah, plans by Albert M. Goedde, 1542A State St., East St. Louis, 1st unit, brick, concrete, school. Approx. $500,000.

▲ **Ill., Roxana**—SCHOOLS—Roxana Community School Dist., Bd. Educ., c/o S. W. Fry, supt., High School, Chaffee and Thomas Aves., voted $1,500,000 bonds, 3 elementary schools and high school addn. CD 2/28.

▲ **Ind., Indianapolis**—HOUSING—Indianapolis Housing Auth., 2727 Washington Blvd., plans by Skidmore, Owings & Merrill, 100 W. Monroe St., Chicago, 3, Ill., 475 unit housing. $4,000,000.

▲ **Ia., Council Bluffs**—AUDITORIUM—City, auditorium, $1,000,000.

▲ **Mass., Boston**—HOUSING—City of Boston Housing Auth., 230 Congress St., plans by M. A. Dyer Co., 24 School St., 3 and 6 story, bsmnt., brick, steel, concrete housing Proj. PHA Mass. 2-20, Columbia Point, $18,000,000. CD 12/15/48.

▲ **Mass., Lexington**—SCHOOL—Town, Bd. Educ., 1475 Massachusetts Ave., voted $1,770,000 bonds, high school.

▲ **Mass., Stoneham**—SCHOOL—Town, Supt. Schools, 3 story, brick, concrete high school, $1,500,000.

Mich., Ionia—HOSPITAL—State, A. N. Langius, dir. State Bldg. Dpt., Lansing, plans by H. E. Beyster & Assoc., Inc., 2000 Industrial Trust Bldg., Detroit, brick, steel, concrete Ionia State Hospital for Criminally Insane, $979,000. CD 1/16.

Mo., Lee's Summit—SCHOOL—Reorganized School Dist. 7, voted $491,000 bonds Mar. 27, school.

▲† **Mo., Weldon Spring**—ATOMIC ENERGY RESEARCH—Atomic Energy Comn., 1901 Constitution Ave. N. W., Wash., D. C. atomic energy research development facility on site of Weldon Spring Ordnance Works, $100,000,000. California Research & Development Co. subsidiary of Standard Oil Co. of California, 225 Bush St., San Francisco, Calif., archt.-engr.-management contractor. CD 3/2.

▲ **Neb., Omaha**—SCHOOLS—Bd. Educ., 3902 Davenport St., plans by Noel S. Wallace, Omaha Natl. Bank Bldg., Adams School addn. $445,000, CD 11/28/49; plans by Steele, Sandham & Steele, Electric Bldg.,

Sherman School addn., $465,000; Jefferson School, $672,378; plans by John Latenser & Sons, 1307 Farnam St., Harrison School addn., $520,000; Field School addn., $420,000. CD 2/27.

Neb., Sidney—HOSPITAL—Cheyenne Co., Sidney, $660,000 bond election Apr. 24, hospital. CD 3/1.

† Nev., Las Vegas—PLANT—U. S. Bureau Mines, New Costum House, Denver, Colo., plans by F. C. Torkelson Co., archt. and engr., 146 S. West Temple St., Salt Lake City, Utah, manganese pilot plant. $600,000.

▲† N. J., Fort Monmouth—LABORATORY—U.S. Eng., 121 N. Broad St., Phila., Pa., plans by The Ballinger Co., consult. engrs. and archts., 121 N. Broad St., Phila., Pa., Consolidated Signal Corps. research and development laboratory. $20,000,000.

▲ Pa. Harrisburg—GARAGES—City, City Hall, 3 parking garages, Cowden St. between Walnut and Strawberry Sts.; Court St. between Chestnut and Cherry Sts.; River St. between Pine and Cranberry Sts., recommended by Harrisburg Advisory Council, under consideration as a parking authority project. $1,500,000.

▲† Pa., Phila.—AIR MATERIAL CENTER—Dpt. Navy, Pub. Wks. Office, Phila. Naval Base, Phila. Plans by The Ballinger Co., 121 N. Broad St., Naval Air Material Center, addnl. development test and supporting facilities. $1,000,000.

† Pa., Phila.—OFFICE—General Service Admin., 250 Hudson St., New York, N. Y., Sheraton Hotel† changeover to office bldg. for govt. use.) $500,000. CD 1/6/47, under Phila., Pa. Sheraton Hotel Corp., Commercial Buildings.

▲† S. C., Charleston—STORAGE PLANT—U. S. Eng., 33 Custom house, fuel storage plant. $1,500,000. J. E. Sirrine Co., 215 Main St., Greenville, consult. engr.

▲ Tenn., Knoxville—SUPREME COURT—State Building Comn., State Capitol, Nashville, supreme court bldg. for East Tennessee. $1,500,000.

▲† Tex., Amarillo—HOUSING—U. S. Atomic Energy Comn., Los Alamos, N. M., housing to house approx. 1,000 prospective employees of new Pantex Atomic Energy production plant, near here. $1,750,000.

Tex., Cleveland—SCHOOLS—Cleveland Independent School Dist., Cleveland, voted bonds, elementary and Junior High School, $300,000; 16-room elementary school, $300,000. Emory S. White, West Bldg., Houston, archt. CD 3/16.

▲ Tex., El Paso—SCHOOLS—El Paso Independent School Dist., El Paso, plans by Carroll & Daeuble, 1001 E. Yandell Blvd., Fort Bliss High School, Tex. 51-C-8-C, $1,625,000; school, Biggs Field Air Force Base, Tex. 51C-8-C, $301,462.

▲† Va., Norfolk—HOUSING—U. S. Eng., foot of Front St., temporary housing, cafeteria, imprv. rail sys. at Army Embarkation Base. $2,500,000.

▲† Wash., Richland—RADIOCHEMISTRY, etc.—Atomic Energy Comn., 1901 Constitution Ave. N.W., Wash. 25, D. C.; 108,900 sq. ft. radiochemistry bldg., $4,000,000; 21,600 sq. ft. radio metallurgy bldg., $1,000,000, L. S. Rosener, 233 Sansome St., San Francisco, Calif., consult. engr.; 51,200 sq. ft. pile technology bldg., $2,000,000, C. T. Main, Inc., 80 Federal St., Boston, Mass., consult. engr.; library and files bldg., $175,000; laboratory supply bldg., $175,000, all at Hanford Works.

▲ Alaska, Fairbanks—HOUSING—Alaska Housing Auth., Anchorage, plans by Miller & Ahlson, 1410 Hubbel Pl. Seattle, Wash., 74 unit housing. $1,000,000. CD 3/28.

▲ Ont., Oshawa—HOSPITAL—Oshawa General Hospital Bd., Oshawa, plans by Govan, Lindsay, Ferguson, Kaminker, Maw, Langley & Keenleyside, 515 Jarvis St., Toronto, hospital addn. $1,500,000.

Que., Boischatel—SCHOOL—School Comn., Boischatel school, $500,000.

Que., L'Annonciation—HOSPITAL—Hospital Bd. L'Annonciation, hospital, $500,000.

Que., Rosemount—SCHOOL—Montreal Catholic School Comn., 117 St. Catherine St. W., Montreal, Que., plans by J. Damphousse, 1459 Belanger St. E., Montreal, 3 story Ecole St. Mathieu, 8 Ave. and Jean Talon St. E. Approx. $315,000.

COMMERCIAL BUILDINGS

Calif., Los Angeles—CLINIC—Childrens Hospital Society, 4614 Sunset Blvd., plans by Beelman & Spackler, 7421 Beverly Blvd., 75-bed 3 story, reinf. con. Michael T. Connell Clinic $900,000. CD 5/11/48.

▲ Calif., Sunnyvale—HOMES—KAR Constr. Co., Sunnyvale, 500 home subdivision project, on 123 acre site Austin N. Losse ranch, near here. $5,000,000.

▲ Ga., Atlanta—HEALTH RESEARCH CENTER—Emory University 36 Butler St. S. E., plans by Robert & Co. Assocs. 96 Poplar St., health research center, $12,000,000.

▲ Minn., St. Louis Park—APARTMENT HOTEL—Sheldon-Thomas Co., Inc., 316 National Bldg., Minneapolis, 8 story, 80x180 ft. apartment hotel, Excelsior Blvd. between Quentin and Wooddale Aves. $1,200,000.

N. J., Haddonfield—SCHOOL, etc.—Catholic Diocese of Camden, 721 Cooper St., Camden, plans by Ricker & Axt, 6105 Hudson Ave., West New York, N. Y. school and rectory, $525,000.

N. D., Minot—HOME FOR AGED—Lutheran Home for Aged, Rev. R. Ulvider, pastor, Minot, plans by Wm. F. Kurke, 1117 13 Ave. N., Fargo, home for aged. $500,000. CD 7/20/45.

Tex., Waco—RAMSEUR HALL—Baylor University, Waco, plans by Tholmas, Jameson & Merrill, 820 N. Harwood St., Dallas, replacing 4 story Ramsur Hall. $700,000.

Tex., Waco—VOCATIONAL—Waco Methodist Home, Waco, 5 unit institutional vocational training bldgs. $550,000.

▲ Wash., Spokane—HOUSES—Modern Home Builders, 3849 34 Ave. W., Seattle, 84 houses in Buena Vista addn. in northwest part of city, $1,000,000.

▲ Ont., Toronto—OFFICE—Crown Life Insurance Co., Younge and Colborne Sts., plans by Marani & Morris, 1250 Bay St., head office, $3,000,000. CD 2/13/50.

INDUSTRIAL BUILDINGS

Kan., Holcomb—PLANT—Kansas-Nebraska Natural Gas Co., Phillipsburg, 44,000,000 cu. ft. dehydration plant, $750,000; compressor station, $125,000.

Md., Baltimore — MANUFACTURING—Kieckhefer Container Corp., North Broadway, Camden, N. J., plans by Walter C. Carson, 16 S. Broad St., Phila. Pa., mfg. plant, $400,000, Egli & Gompf, Inc., 1019 N. Calvert St., engr. CD 3/15.

▲ Mass., Natick—PLANT—Laboratory for Electronics, Inc., 11 Leon St., Roxbury, Mass., plans by Thomas Worcester, Inc., 84 State St., Boston, 8 story center bldg. with 1 story wings, 100,000 sq. ft. radar plant, Lake Cochituate, $2,000,000. (Correction-owner). CD 3/20, under Martin Carel, as owner.

Mass., Worcester—WAREHOUSE, etc.—Merrill & Usher Co., 5 Arctic St., warehouse and fabricating plant, Prescott St. $750,000, Albert J. Daniels, 661 Main St., Shrewsbury, consult. engr. CD 1/9.

▲ Okla., Choteau—CARBIDE PLANT—Midwest Carbide Co., Keokuk, Ia., carbide plant to be built in former Oklahoma Ordnance Works area, near here. $3,000,000.

▲ Pa., Pittsburgh—FOUNDRY—Union Steel Castings Div. of Blaw-Knox Co., 62 and Butler Sts., plans by Hunting Larsen & Dunnells, Inc., 1150 Century Bldg., steel frame foundry expansion. $500,000.

Tenn., Memphis—PLANT—Essex Wire Corp., 1601 Wall St., Fort Wayne, Ind., steel, concrete, 75,000 sq. ft. plant. $500,000.

▲ Tex., Baytown—SHOPS—Humble Oil & Refining Co., Humble Bldg., Houston, plans by Wyatt C. Hedrick, archt. and engr., 5201 Fannin St., Houston, 6 shops. $1,000,000. CD 4/4.

▲ Tex., Houston—MILL—Adolphus Rice Mills, 4600 Clinton Dr., construct 2nd rice mill unit. $1,500,000. CD 2/26.

Tex., Houston—WAREHOUSE—Danburg Stores, Inc., 33 Artesian St., 4 story addn. to existing 1 story (with 5-story fdn.) masonry warehouse. $500,000.

▲ Tex., San Antonio—PLANT—Carroll B. Fulton & W. H. Olmstead, 645 Grandview St., aviation gasoline plant. $11,925,000.

Wash., Benton—STOREROOM and GARAGE—Puget Sound Power & Light Co., Stuart Bldg., Seattle, Zone 1, 100x400 ft., steel, masonry storeroom and garage on piling foundation. $500,000.

▲ Wash., Everett—PULP PLANT—Weyerhauser Timber Co., Tacoma Bldg., Tacoma, pulp plant, $19,125,000. CD 1/17/50.

Wash., Seattle—PLANT—Monsanto Chemical Co., 1700 S. 2 St. St. Louis, Mo., plant to produce semi-refined vanillin from lignin, $500,000.

Wis., Madison—DAIRY PLANT—Madison Milk Products Assn., 29 Coyne St., plans by Geo. Tooley & Assoc., River Falls, dairy plant. $500,000.

▲ Alta., Edmonton—PLANT—Sherritt Gordon Mines Ltd., 25 King St. W., Toronto, Ont., nickel and copper recovery plant. Approx. $5,000,000.

▲ Northwest Territories, Port Radium—MILL—Eldorado Mining & Refining Co. Ltd., Port Radium (Great Bear Lake) mill construction. $1,500,000.

Que., Timiskaming—PLANT—Canadian International Paper Co. Ltd., Timiskaming, Que., plant, Approx. $500,000.

UNCLASSIFIED

Illinois — TELEPHONE SYSTEM — Champaign County Telephone Co., Champaign, exten. imprv. rural telephone sys. $453,000.

▲ Tennessee — TELEPHONE SYSTEM — North Central Electric Co-operative, Gainesboro, Tenn., telephone sys. in Macon, Jackson, Sumnerland and adjoining counties. $2,500,000. Marr & Holman, Stahlman Bldg., Nashville, consult, engrs.

Texas—OIL LINE—Frontier Pipe Line Co., McAllen, Tex., doubling 75 mi. 6 in. crude oil line between McAllen and Port Isabel. $550,000.

▲ Texas—BAYTOWN TUNNEL—State Hy. Comn., Austin, Contr. No. II, Baytown Tunnel, a sub-aqueous, vehicular, two lane, 22 ft. roadway tunnel, forming part of Texas State Hy. 146, crossing the Houston Ship Channel in Harris Co., some 20 mi. below Houston, Tex., total portal to portal length will be 3.009 ft., on the south and north ends of tunnel there will be open cut approaches, each 551 ft. long, incl. completion of project consisting of construction two 226 ft. tunnel sections, incl. ventilating bldg., to be constructed in open cut; two open approach sects. each 551 ft. long; garage and maintenance bldg.; crash truck garage; plumbing and drainage; electrical work, incl. all tunnel lighting; mechanical work and tunnel ventilation system; ceramic tile and architectural terra cotta throughout entire length of tunnel; niche frames and covers; embankment at north and south ends of project, required for service roads, landscaping, etc. $3,275,000. Parsons, Brinkerhoff, Hall & Macdonald, 51 Broadway, New York, N. Y. and/or Bankers Mortgage Bldg., Houston, Tex., consult engrs. CD 7/30/43, under Streets and Roads.

▲ Wash., Seattle—WIND TUNNEL—Boeing Airplane Co., 7755 E. Marginal Way, Seattle, wind tunnel addn. $1,405,000. S. Ivarson, Skinner Bldg., Seattle, Zone 1, consult, engr. CD 8/18/50.

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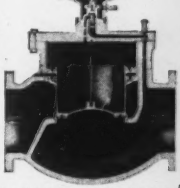

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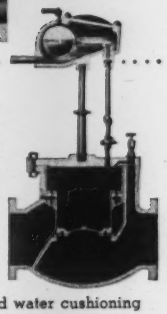

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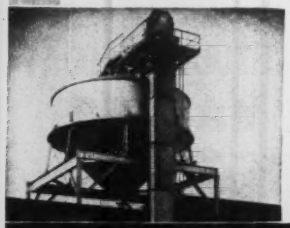

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CONSTRUCTION REPORTS–Second Section

NEW ENGLAND

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
April 24, New England

BIDS ASKED—BUILDINGS

▲ **Conn., New Britain**—SCHOOL—B.A. 4/23—City Bd. Educ., 27 Hillside Pl., school Slater Rd. $1,100,000. Plans deposit $50. CD 2/20.

SOON LETS CONTRACTS—BUILDINGS

Mass., Melrose—HOSPITAL—Melrose Hospital, 565 Lebanon St., soon lets contract surgical unit and alterations to existing bldg., Porter St. $600,000-$700,000. CD 1/17.

LOW BIDDERS—BUILDINGS

▲† **Gust K. Newberg Constr. Co.**, 2040 N. Ashland St., Chicago, Ill. Low Bidder. $17,887,000. HOSPITAL bldgs., utilities, Manly and West Chester Sts., BROCKTON, MASS. Veterans' Admin., Technical Service, Munitions Bldg., Wash., D. C. Bids Apr. 10. CD 3/26.

A. F. Peaslee, Inc., 15 Lewis St., Hartford, Conn. Low Bidder. $961,000, HIGH SCHOOL, Clark Site, N. Main St., TERRYVILLE, CONN. Town of Plymouth, Town Hall, Plymouth Conn. Bids Mar. 30. CD 3/15.

CONTRACTS—BUILDINGS

▲ **George A. Fuller Co.**, 11 Beacon St., Boston, Mass. Contract Awarded. $740,000. 3 story 64x230 ft., rein.con., brick SCIENCE LABORATORY; $625,000, rein.-con., brick SCIENCE BLDG. and LECTURE HALL, CAMBRIDGE, MASS. Harvard University, University Hall, Cambridge, Mass. CD 11/21.

▲ **United Engineers & Constructors, Inc.**, 140 Arch St., Phila., Pa. Contract Awarded. $1,000,000. GENERATING PLANT, WESTERLY, R. I., Narragansett Electric Co., 49 Westminster St., Providence, R. I. CD 3/13.

MIDDLE ATLANTIC

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
May 2, New Jersey
STREETS AND ROADS
May 2, New Jersey

N. Y., Port Richmond—B.A. 4/25—Dpt. P. Wks., Municipal Bldg., New York, Zone 7, Contr. A, structures and equip.; Contr. B, electrical equip. for work at Port Richmond Sewage Treatment Works. Plans deposit $25. Bids 2/15 rejected.

Pa., Mayview—B. A. 4/25—General State Auth., 18 and Herr Sts., Harrisburg, sewage treatment plant, pumping station, sewerage sys., drainage and sewage collection sys. at Mayview State Hospital. $400,000. Plans deposit $10. Morris Knowles, 1312 Park Bldg., Pittsburgh, Zone 22, engr. CD 3/30, under LB.

BIDS ASKED—BUILDINGS

▲ **Md., Towson**—SCHOOL—B.A. 4/24—Baltimore Co. Bd. Educ., Aigburth Rd., Zone 4, 2 story, part bsmnt., brick, steel North Point Junior High School, Wise and Merritt Aves. $1,500,000. Plans deposit $50. Smith & Veale Assoc., 2127 N. Charles St., Baltimore, archts. Van Rensselaer Saxe, 100 W. Monument St., Baltimore, struct. engr. Egli & Gompf, Inc., 1019 N. Calvert St., Baltimore, mech. engr. CD 3/28/50.

N. J., Hasbrouck Heights—HIGH SCHOOL—B.A. 4/24—Bd. Educ., 250 Franklin Ave., high school, La Salle Ave. $825,000. CD 10/17/45.

Pa., State College—LABORATORY—B.A. 4/25—General State Auth., 18 and Herr Sts., Harrisburg, completion Buckout (Biological) Laboratory at Pennsylvania State College. $500,000. Plans deposit $10. Extended date. Zantzinger & Borie, 1531 Locust St., Phila., Zone 2, archts., A. F. Jones, c/o owner, ch. engr. CD 3/14.

▲† **N. Y., Voorheesville**—SHOP—B.A. About 4/26—U. S. Eng., 80 Lafayette St., New York, Zone 13, engineer base maintenance shop and reconstruction 2 burned out warehouse units at Schenectady General Depot, No. Eng 30-075-51-608. $1,000,000-$2,000,000. Plans deposit $35.

Md., Ellicott City—SCHOOL—B.A. 4/26—Howard Co. School Comrs., Court House Annex, 1 and 2 story, 168x200 ft., 60x165 ft., brick, cinder block high school, Jonestown, $800,000. Plans deposit $50, Johannes & Murray, 855 Pershing Drive, Silver Spring, archts. CD 9/6.

N. Y., New York—HOSPITAL—B.A. 5/2—Dpt. P. Wks.

Pa., Phila.—SYNAGOGUE—Bids Asked—At office Louis Magaziner, 1701 Walnut St., synagogue for Temple Israel of Wynnefield, Rabbi Sherman Novseller, 59 St. and Drexel Rd. $500,000. CD 12/23/48.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Torrington Constr. Co., Inc.**, Torrington, Conn. Low Bidder, $248,572, 4.21 mi. Taconic State Parkway, Dutchess Co.***Horn Constr. Co., Inc., 1776 Broadway, New York 19, N. Y., $1,123,096, 2.24 mi. Palisades Interstate Parkway and 1.93 mi. access road, Rockland Co.***Auburn Constr. Co., Auburn, N. Y., $129,936, 2.85 mi. of County Road 105, Yates Co.***Gull Contr. Co. & Tully & DiNapoli, Inc., 33-15 Lawrence St., Flushing, N. Y., $2,387,834, grading, paving 0.48 mi. Van Wyck Expressway, Queens Co.***Kusciano & Sons Corp., 728 E. 212 St., New York 67, N. Y., $3,297,640, 12.35 mi. Taconic State Parkway, Columbia and Dutchess Counties, NEW YORK. Bureau Contracts & Accounts, Albany, N. Y. Bids Apr. 11, CD 3/23.

▲† **Arundel Corp.**, foot of Fulton St., Brooklyn, N. Y., Low Bidder. $1,223,810, est. $1,085,368. dredging and rock removal in Newark Bay, vicinity of Bergen Point, NEW JERSEY. U. S. Eng., 80 Lafayette St., New York, 13, N. Y. Bids Mar. 27. CD 3/14.

▲† **Gahagan Constr. Corp.**, 90 Broad St., New York 4, N. Y. Low Bidder $3,270,315, est. $2,284,363 dredging Perth Amboy Anchorage, New York and New Jersey Channels, NEW YORK and NEW JERSEY. U. S. Eng., 80 Lafayette St., New York 13, N. Y. Bids Mar. 7. CD 2/21.

LOW BIDDERS—BUILDINGS

▲ **Depot Constr. Corp.**, 119 W. 57 St., New York 19, N. Y. Low Bidder. $1,249,000. P. S. 112 SCHOOL, Crescent St. and 37 Ave., LONG ISLAND CITY, N. Y. Supt. School Bldgs., Design & Construction, 449 Flatbush Ave. exten., Brooklyn, Zone 1, N. Y. Bids April 3. CD 3/15.

▲ **J. Alexander Stein**, 103 E. 125 St., New York 35, N. Y. Low Bidder. $1,467,000. Senior High School, Port Washington Blvd., PORT WASHINGTON, N. Y. Bd. Educ., Union Free School Dist. 4, Port Washington, N. Y. Bids Mar. 26 CD 3/15.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Union Switch & Signal Co.**, 350 Fifth Ave., New York 1, N. Y. Contract Awarded. $1,676,800, furnishing, del. block signalling and interlocking equip. for Lenox-White Plains Rd line signalling, Track M-Brook Ave. to 241 St. and local tracks, 135 St. to Brook Ave. IRT Div. Manhattan and Bronx Boros NEW YORK, N. Y. Bd. Transportation, 370 Jay St., Brooklyn 1, N. Y. Bids Mar. 16, awarded Mar. 17. CD 3/19.

▲ **T. & T. Cont. Co.**, 4814 Glenwood Rd., Brooklyn, N. Y. Contract Awarded. $1,127,787, grading Avenue T, E. 56, E. 57, E. 58, E. 59, E. 61, E. 63, E. 65, E. 66 and E. 67 Sts. and temporary storm outlet sewer across park lands adjacent to prolongation of E. 61 St. and from the United States pierhead and bulkhead line of Mill Basin to Point approx. 40 ft. northerly; storm sewer, Ralph Ave., Avenue T; storm and sanitary sewer, Avenue O, Avenue T, Mill Ave., E. 56, E. 57, E. 58, E. 61, E. 63, E. 64, E. 65, E. 66 and E. 67 Sts., BROOKLYN, N. Y. President Brooklyn Boro, Boro Hall, Brooklyn, 12, N. Y. Bids Mar. 26. CD 3/15.

▲ **Franklin Contg. Co.**, 12 Central Ave., Newark, N. J., Contract Awarded $1,161,797. dualization Route 29 Sect. 7B from Mercer St. to Thompson Ave., Somerville and Bridgewater, Somerset Co., NEW JERSEY, State Hy. Dpt., 135 Parkway Ave., Trenton, N. J. Bids Feb. 13, awarded Mar. 2. CD 2/19, under LB.

▲† **Cramer-Vollmerhausen Co., Inc.**, 2601 Connecticut Ave., N. W. Wash., D. C. Contract Awarded, Approx. $1,275,700. submarine propulsion test facilities, NOY 24113, Spec. 26410, PHILA., PA. Dpt. Navy, Phila. Naval Base, Phila. Pa.

Camden Constr. Co., Inc., 1301 Towson St., Baltimore, Md. Contract Awarded. $781,675. concrete floors and sidewalks and steel handrails for 2.856 ft. Severn River Bridge, Anne Arundel Co., MARYLAND. State Rds. Comn., Baltimore 2, Md CD 2/23, under L.B.

▲ **Utilities Constr. Co.**, Lutherville, Md. Contract awarded $1,249,238, Contract 3, 9,500 ft. 72 and 84 in. concrete pipe and 9,000 ft. 8- to 16-in. c. i. water mains, WILMINGTON, DEL. City, City Hall, Wilmington, Del. Bids Mar. 13. CD 4/5 under LB.

Vanguard Constr. Corp., 369 Lexington Ave., New York, N. Y., Contract Awarded, $979,891, Sewage Pumping Station No. 2, WILMINGTON, DEL. City, Street & Sewer Dpt., Wilmington, Del. Bids Mar. 6. CD 3/29, under LB.

CONTRACTS—BUILDINGS

▲ **Howard Apartments**, c/o Philip Birnbaum, archt., 12 E. 48 St., New York, 17, N. Y. Owner Builds. $4,000,000. 3 twelve story APARTMENTS, Queens Blvd. between 66 Rd. 67 Ave., FOREST HILLS, N. Y. CD 11/23/49.

▲ **Deepdale Gardens**, c/o Praver & Lee, 124-36 Queens Blvd., Lew Gardens, N. Y. Owner Builds. Approx. $11,000,000. co-operative garden APARTMENTS for 1,396 families on 60 acre tract bounded by Marathon Parkway, Little Neck Parkway, Horace Harding Blvd. and 63 Ave., LITTLE NECK, N. Y. Benjamin Braunstein, 163-18 Jamaica Ave., Jamaica, N. Y., archt.

Arthur Venneri Co., 300 North Ave. E., Westfield, N. J., Low Bidder, general constr. $764,887, Pocahontas Lake HOUSING Proj., NJ 23-1 MORRISTOWN, N. J. Housing Auth., Town of Morristown, 13 Speedwell Ave., Morristown, N. J. Bids Mar. 27. CD 3/21.

▲ **Moyer Bros.**, 2605 Beale Ave., Altoona, Pa., Contract Awarded. $1,197,000. est. $1,611,602, HOUSING Proj. No. 29, Pleasant Valley, ALTOONA, PA. Altoona Housing Auth., 509 S. 27 St., Altoona, Pa. Bids Jan. 25. CD 1/12.

H. B. Alexander & Son, Inc., 315 Vaughn St., Harrisburg, Pa. Contract Awarded. $529,387, est. $725,000. general constr. secondary SCHOOL for Armaugh-Brown Joint School Bd., ARMAUGH TWP. (P.O. Reedsville) PA. State Public School Bldg. Auth.,

(Continued on page 82)

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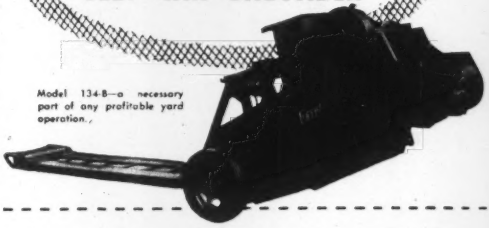

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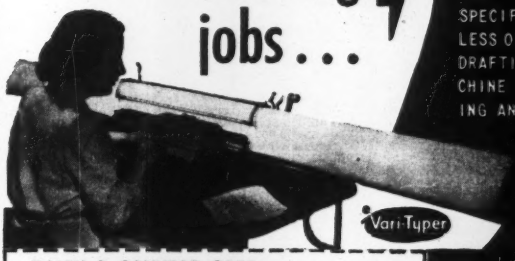

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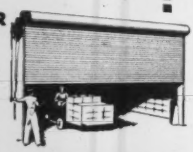

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(Continued from page 80)

1400 N. Cameron St., Harrisburg, Pa. Bids Mar. 8, awarded Apr. 2. CD 3/14. under LB.

▲ **Wilpute Coke Oven Div.,** 40 Rector St., New York, N. Y. Contract Awarded. Approx. **$1,000,000.** 23 COKE OVENS, ERIE, PA. Interlake Iron Corp., foot of Waynes St., Erie, Pa.

▲ **Parkman Homes, Inc.,** 1740 Georges Lane, Phila. Pa. Separate Contracts. Approx. **$1,000,000** RESIDENTIAL DEVELOPMENT, Benner St. PHILA. PA. Christian Fries, 3701 N. Broad St., Phila. Pa., archt

SOUTH

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
STREETS AND ROADS
May 2, Louisiana

BIDS ASKED—BUILDINGS

▲ **Tenn., Nashville**—HOSPITAL—B. A. About 5/1—State Bd. Health, State Office Bldg., Middle Tennessee TB hospital $4,000,000. Marr & Holman,

Ga., Dublin—HOSPITAL—B.A. 5/1—Laurens Co., hospital, $675,000. Extended date. Abreu & Robeson, 22 Marietta St. Bldg., Atlanta, archts. CD 2/12.

Tenn., Paris—HOSPITAL—B.A. 5/1—Henry County Hospital, Paris, 3 steel, concrete hospital wings, asph. tile floors, concrete fdn., 4 story. $500,000. J. Frazer Smith, Goodwyn Bldg., Memphis, archt. CD 9/5

LOW BIDDERS—HEAVY CONSTRUCTION

† **Doyle & Russell,** Central Natl Bank Bldg., Richmond, Va., Low Bidder, **$818,492,** construct roadbed for landing loads truck, LANGLEY FIELD, VA. U. S. Eng., foot of Front St., Norfolk, Va. Bids Mar. 23. CD 3/23.

Lang Constr. Co., 21 S. King St., Hampton, Va. Low Bidder. **$866,275.** Lake Prince Pumping Station 2, NORFOLK, VA. City, City Hall, Norfolk, Va. Bids 3/28. CD 2/26.

▲ **G. E. Moore Co.,** Greenwood, S. C. Low Bidder. **$1,365,252.** Sanitary sewer extens., FLORENCE, S. C. City, City Hall, Florece, S. C. Bids Apr 4. CD 3/9.

Concrete Constr. Co., 137 Boulevard N. E., Atlanta, Ga. Low Bidder, Div 1, **$604,837, Greene & O'Donnell,** 2050 Liddle Dr. N. E., Atlanta, Ga., **$320,000,** Div. 2, sanitary sewer imprvs., DALTON, GA. City, Dalton, Ga. Bids Mar. 27. CD 3/1.

▲† **Testa Brothers, Inc.,** Citizens Bldg., Cleveland, O., Low Bidder, **$1,157,400,** constr. work on Levee L-30 on Central and Southern Flood Control Proj. in Dade and Broward Counties, FLORIDA. U. S. Eng., 575 Riverside Ave., Jacksonville, Fla. Bids Mar. 27. CD 3/1.

LOW BIDDERS—BUILDINGS

▲ **Dewey G. Weddle & Co.,** Natl. Bank of Commerce Bldg., Norfolk, Va. Low Bidder. **$1,563,633.** HOUSING Project VA 6-4, NORFOLK, VA. Norfolk Redevelopment & Housing Auth., Dickson Bldg., Norfolk, Va. Bids Apr. 4. CD 3/29.

† **Doyle & Russell,** Central Natl. Bank Bldg., Richmond, Va. Contract Awarded, **$818,492,** construct roadbed for landing Track L-No. 2, LANGLEY FIELD, VA. U. S. Eng., foot of Front St., Norfolk, Va. Bids Mar. 23. CD 4/5, under LB.

▲ **T. L. James & Co.,** Ruston, La. Contract Awarded. **$1,050,146.** c. conc., wid'n. rein.-con. deck girder bridges 11.165 mi. Lobdell-Erwinville Hy., State Rte. C-1500, S. P. 8-1-12 and 8-02-09, West Baton Rouge Parish, LOUISIANA. State Hy. Dpt., Baton Rouge, La. Awarded Apr. 4. CD 3/29, under LB.

▲ **Thomas D. Nolan,** Shepherdsville, Ky. Contract Awarded. **$1,123,023.** 2nd section Sneads Branch sewer from Shelby Parkway to Shelby St. and on to Delor St., LOUISVILLE, KY. Metropolitan Sewer Comn., 418 Jefferson St., Louisville, Ky. CD 3/29, under L.B.

CONTRACTS—BUILDINGS

Nielson Constr. Co., Harrisonburg, Va. Contract Awarded, **$531,818,** HIGH SCHOOL, HARRISONBURG, VA. City, Harrisonburg, Va. Bids Jan. 22. CD 1/24, under LB.

W. D. Hobbs, Jr. Providence Terrace, Norfolk, Va. Owner Builds. Approx. **$500,000.** 78 HOMES, NORFOLK, VA.

▲ **Southeastern Constr. Co.,** Peoples Bldg., Charleston, W. Va. Contract Awarded. Approx. **$3,174,860.** 4 story bsmnt., 44x122x278 ft., T-shaped, steel brick, block city HOSPITAL, WEIRTON, W. VA. City, City Bldg., Weirton, W. Va. Bids Feb. 27. CD 43, under LB.

▲ **McDevitt & Street Co.,** Builders Bldg., Charlotte, N. C. Contract Awarded. **$1,138,820.** CHURCH and CHAPEL, CHARLOTTE, N. C. Covenant Presbyterian Church, 214 N. Tryon St., Charlotte, N. C. Bids Apr. 3. CD 3/9.

H. & H. Constr. & Realty Co., Concord, N. C. Owner builds. Approx. **$700,000.** 75 HOMES, CONCORD, N. C.

Charleston Constructors, Inc., Adgers Wharf, Charleston, S. C. Contract Awarded. **$543,543.** HOSPITAL fdns., CHARLESTON, S. C. Medical College of State of South Carolina, Charleston, S. C. Bids Feb. 16. CD 3/6, under LB.

▲† **Daniel Constr. Co.,** 429 N. Main St., Greenville, S. C. Contract Awarded, **$2,680,000.** low rent HOUSING, S. C. 4-3, GREENVILLE, S. C. Greenville Housing Auth., James F. Daniel, Jr., exec. dir. 432 Perry Ave., Greenville, S. C. Bids Mar. 14. CD 3/20, under LB.

Burdine Constr. Co., Box 283, Greenville, Miss. Contract Awarded. **$633,107.** fdns., for Alexander Smith Carpet Co. PLANT, GREENVILLE, MISS, City, Greenville, Miss. Bids Mar. 28.

▲ **R. P. Farnsworth & Co., Inc.,** 1515 S. Salcedo St., New Orleans, La. Contract Awarded. **$1,198,960.** ACUTE and DIAGNOSTIC BLDG. at Southeast Louisiana State Hospital, MANDEVILLE, LA. State Div. Admin., Baton Rouge, La. Bids Apr. 5. CD 3/23, under LB.

▲ **Farnsworth & Chambers Co., Inc.,** 3018 Leeland St., Houston, Tex. Contract Awarded. **$1,500,000** 50,000 sq. ft. PLANT adjoining office-laboratory and machine shop facilities, NEW ORLEANS, LA. Red Star Yeast & Products Co., 221 E. Buffalo St., Milwaukee, Wis.

† **Robert E. McKee General Contractor, Inc.,** 1918 Texas St., El Paso, Tex. Contract Awarded. **$900,000.** Concrete IGLOOS, ammunition storage, FORT CAMPBELL, KY. U. S. Eng., 830 W. Broadway, Louisville, Ky. CD 1/23, under LB.

Southern Builders, Inc., Shrine Bldg., Memphis, Tenn. Contract Awarded. **$300,000.** 2 concrete, steel STORES, concrete fdns., air-conditioning, MEMPHIS, TENN. Ablative Realty Co., c/o contractor.

MIDDLE WEST

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 24, Ohio
STREETS AND ROADS
April 24, Ohio

BIDS ASKED—BUILDINGS

▲ **Wis., Milwaukee**—SCHOOLS—B.A. 4/24— Bd. Educ., 1111 N. 10 St., Zone 3, 31 St. and 66 St. Schools, $1,425,000. Plans deposit $75. Grassold & Johnson, 734 N. Jefferson St., Zone 2, engrs. G. E. Wiley, c/o owner; archt. CD 12/14.

▲ **O., Hubbard**—SCHOOL—B.A. 4/26—Bd. Educ., R. F. Clash, clk., Hubbard Exempted Village School Dist., high school, Hall Ave. $1,000,000. Plans deposit $25. Kling & Frost, 661 Wick Ave., Youngstown, archts. CD 12/19/49.

Ill., Chicago—PLANT—Bids Asked—Huss Lumber Co., Fullerton St. at Chicago, Milwaukee, St. Paul & Pacific R. R., brick, steel laminating plant $580,000.

▲ **Ill., Chicago**—HOSPITAL—Bids Asked—Sisters of Resurrection, 7432 Talcott St., 5 story, brick, concrete hospital, $2,500,000. Schmidt, Garden & Erikson, 104 N. Michigan St., archts. CD 10/3.

SOON LETS CONTRACT—BUILDINGS

▲ **Mich., Edmore**—PLANT—Carboloy Co., Inc., 11177 E. 8 Mile Rd., Detroit, soon lets contract carbide metal plant facilities to process tungsten carbide. $2,000,000. Smith-Hinchman & Grylls, 800 Marquette Bldg., Detroit, consult. engrs. CD 3/28.

LOW BIDDERS—BUILDINGS

▲ **J. W. Snyder Co.,** 307 N. Michigan St., Chicago, Ill., Low Bidder, **$1,762,028,** 7 story, brick, steel, concrete Hicks and Smith MEMORIAL HOSPITAL, CHICAGO, ILL. University of Chicago, 905 E. 58 St., Chicago, Ill. Bids Apr. 2. CD 3/15.

▲ **B. W. Handler Constr. Co.,** 223 W. Jackson St., Chicago, 6, Ill. Low Bidder. **$1,951,200,** 2 story, 200 unit housing, LA SALLE, ILL. Housing Auth. of La Salle Co., La Salle, Ill. Bids Dec. 6. CD under CA.

CONTRACTS—HEAVY CONSTRUCTION

▲ **Bass Eng. & Constr. Co.,** 215 Birmingham Theater Bldg., Birmingham, Mich. Contract Awarded, **$3,388,865,** est. $2,921,000, raw water pumping station and treatment plant***National Constr. Co.,** 23500 Lakeland St., and Utilities Constr. Co., Inc., 643 Green St., both of Cleveland, O. **$1,444,415,** est. $1,700,000 force mains for new domestic water supply from Mosquito Reservoir, WARREN, O. City, Joseph C. Hapgood, water dept. supt., Warren, O. Bids Mar. 22, awarded Apr. 5. CD 3/27, under LB.

CONTRACTS—BUILDINGS

▲ **James McHugh Constr. Co.,** 6449 S. South Park St., Chicago, Ill. Contract Awarded. **$2,220,032.** general contract 4 story HOSPITAL addn., DAYTON, O. St. Elizabeth Hospital, 49 Hopeland St., Dayton, O. Bids Feb. 27, awarded Apr. 5. CD 1/30.

▲† **A. Bentley & Sons Co.,** 201 Belmont St., Toledo, O. Contract Awarded. **$1,900,000.** 400x480 ft. automotive maintenance SHOP and 40x120 ft. office, at Rossford Ordnance Depot, ROSSFORD, O. U. S. Eng., Madison Ave. and 8 St. West, Huntington, W. Va. Bids Mar. 30, awarded Apr. 6.

Ludwig Zahn, Mansfield, O. Contract Awarded. **$500,000.** general const. HOSPITAL addn. to Providence Hospital, SANDUSKY, O. Sisters of St. Francis, Providence Hospital, Sandusky, O. Bids Feb. 28. CD 2/14.

Sever-Williams Co., Washington C. H., O. Contract Awarded. $722,000. HIGH SCHOOL addn., TIPP CITY, O. Bd. Educ., Tipp City, O. Ralph Harman, 133 W. High St., Springfield, O., archt. CD 11/16/50.

▲ **Paul S. Schleicher & Sons**, 545 Broadway, Gary, Ind., Owner Builds. $1,500,000, 120 HOMES, HAMMOND, IND. Awarded Mar. 30.

▲ **Harvey A. Hanson**, 1851 N. Elston St., Chicago, 14, Ill., Contract Awarded, $1,013,000, Ogden Elementary SCHOOL, Oak and Elm Sts., CHICAGO, ILL. City, Bd. Educ., 228 N. LaSalle St., Chicago, Ill. Bids Feb. 16. CD 2/27, under LB.

Hoffman C,o. Inc., 1519 N. Oneida St., Appleton, Wis. Contract Awarded, $699,000, general contract 1 story 64'x550 ft., 132x152 ft. 60x80 ft., concrete, steel, brick parochial HIGH SCHOOL, MARSHFIELD, WIS. Columbus High School Assn., Marshfield, Wis. Bids Mar. 19. CD 3/27, under LB.

Miller-Davis Co., 1287 Portage St., Kalamazoo 7, Mich. Contract Awarded. $803,726. POWER PLANT, Ionia State Hospital, IONIA, MICH. State, A. N. Languis, dir. State Bldg. Dpt., Lansing, Mich. Bids Feb. 21. CD 2/1.

Darin & Armstrong, Inc., 2041 Fenkel St., Detroit, Mich. Contract Awarded. $500,000. general constr. battery FACTORY, Telegraph Rd., near southwest city limits, MONROE, MICH. Gould-National Batteries, Inc., Monroe, Mich. CD 3/23.

▲ **Madison Constr. Co.**, 600 Woodward St., Detroit, Mich. Owner Builds. $5,000,000. six hundred 1½ story HOUSES, Fairview Development, ROSEVILLE, MICH. Minoru Yamasaki, 1801 Industrial Bank Bldg., Detroit, Mich., archt.

WEST OF MISSISSIPPI

BIDS ASKED—HEAVY CONSTRUCTION
STATE HIGHWAY LETTINGS
BRIDGES
April 27, Minnesota, Missouri, North Dakota
STREETS AND ROADS
April 24, Kansas
April 27, Kansas, Minnesota, Missouri, North Dakota
May 1, Indiana May 10, Montana

Okla., Talihina—B.A. 4/27—City, WW extens. $40,000. Plans deposit $20. H. T. Lawrence, 1801 N. W. 21 St., Oklahoma City, engr.

Okla., Talihina—B.A. 4/27—City, sanitary sewerage sys. $50,000. Plans deposit $25. H. T. Lawrence, 1801 N. W. 21 St., Oklahoma City, engr.

Texas—GAS PIPE LINE—Bids Asked—Gulf Oil Corp., Port Arthur, 76 mi. 8 in. gas pipe line for transporting gas to chemical plants on coast, $760,000, 32 mi. 6 in. gathering gas lines, $175,000, both at Port Arthur, Jefferson Co. CD 2/15.

Tex., Gregory—Bids Asked—Reynolds Metals Co., Hunt Bldg., 7 mi. ship canal to connect with Intracoastal Canal. $550,000. J. Gordon Turnbull, 2630 Chester St., Cleveland, O., project engrs. CD 2/7, under Industrial Buildings.

Tex., Tahoka—TELEPHONE LINES—Bids Asked—Poka-Lambro Rural Telephone Co-operative, Tahoka, 1,975 mi. above-ground pole telephone lines. $675,000. CD 11/2, under Industrial Buildings.

BIDS ASKED—BUILDINGS

Tex., Fort Worth—HIGH SCHOOL—B.A. 4/30—Fort Worth Independent School Dist., Fort Worth, masonry Diamond Hill High School. $550,000. Preston M. Green, N. P. Anderson Bldg., archts. CD 5/12.

▲ **Mo., St. Louis**—HOSPITAL—B.A. in May—St. Luke's Hospital, Robert Brookings Smith, pres., 5535 Delmar Blvd., Zone 12, 1st unit 4 story, bsmnt. wing with west and east wings and central bldg., 1 story service bldg wing, $2,200,000. LeBeaume & Uniand, 315 N. 7 St. and Wischmeyer & Lorenz, 911 Locust St., Zone 1, assoc. archts. Leslie J. Bergmeier, 1504 S. Grand Ave., Zone 4, struc. engr. Ferris & Hamig, 1706 Olive St., Zone 3, mech. engrs. CD 6/5.

Tex., Taylor—HOUSING—B. A. 5/1—Taylor Housing Auth., Taylor, 70 units, 1 story, brick veneer housing units. Approx. $500,000. Howard, Johnson & Kelly, Scanlan Bldg., Houston, engrs. Cameron Fairchild, 2626 Westheimer Rd., Houston, archts. CD 9/14/50.

▲ **Tex., Bishop**—PLANT—Bids Asked—Celenese Corp. of America, Bishop Tex., chemical plant expansion. $3,502,000. CD 3/20.

▲ **Tex., Fort Worth**—PLANT—Bids Asked—Bell Aircraft Corp., Niagara Falls Blvd., Buffalo, N. Y., Unit 1, helicopter plant unit. $3,000,000. CD 4/4.

LOW BIDDERS—HEAVY CONSTRUCTION

† **Jensen Constr. Co.**, 1901 Easton Blvd., Des Moines, Ia. Low Bidder. $795,100, sheet pile wall for Oahe Reservoir, Inv. 113, SOUTH DAKOTA. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 27. CD 3/6.

Sisco Electric Co., Conroe, Tex. Low Bidder. $636,055, est. $650,000. 125 mi. 69 k.v. electric distr. lines, Caddo Co., OKLAHOMA. Western Electric Co-operative, Anadarko, Okla. C. H. Guernsey & Co., 2701 N. Oklahoma St., Oklahoma City, Okla., engrs. CD 2/13/50.

▲† **Atlantic, Gulf & Pacific Dredging Co.**, Citizens Bank Bldg., Houston, Tex. Low Bidder, $1,287,454, est. $1,650,000. dredging Houston Ship Channel from Lynchburg to vicinity shell refinery and Hunting Bayou to Turning Basin, Inv. No. CIVENG 41-243-5180, TEXAS. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Mar. 30. CD 3/22.

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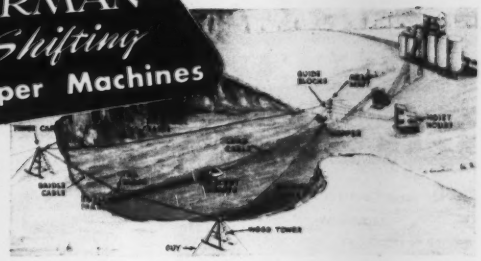

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▲ **Cullum & Whittle Constr. Co.,** Great Natl. Life Bldg., Dallas, Tex. Low Bidder, **$2,699,437,** Contr. 360-B, White Rock Sewage Treatment Plant, DALLAS, TEX. City, City Hall, Dallas, Tex. Bids Apr. 3. CD 2/27.

▲† **F. S. Birch & Sons Constr. Co.,** Ford Bldg., Great Falls, Mont., **McLaughlin, Inc.,** Ford Bldg., Great Falls, Mont. and **F & S Contracting Co.,** 1300 Chicago St., Butte, Mont. Low Bidder. **$2,348,213.** excav., earthwork, structures, except bridges 47 mi. Forest Service Road on west side of Hungry Horse Reservoir, south and west shore of reservoir to point 0.4 mi. upstream from Hungry Horse Dam, MONTANA. Bureau Reclamation, Hungry Horse Gov't Camp, Columbia Falls, Mont. Bids Apr. 3. CD 2/28.

LOW BIDDERS—BUILDINGS

† **Riedesel-Lowe Co.,** Cheyenne, Wyo. Low Bidder. **$653,350.** MAINTENANCE bldg. at Sioux Ordnance Depot, Inv. 20, SIDNEY, NEB. U. S. Eng., 1709 Jackson St., Omaha, Neb. Bids Mar. 22. CD 3/15.

The **McRan Co.,** 9999 Hempstead Rd., Houston, Tex. Low Bidder, **$86,933,** est. $145,000, GARAGE-SHOP and SERVICE STATION, EAST BERNARD, TEX. Union Motor Co., East Bernard, Tex. Bids Mar. 23. CD 3/20.

▲ **Murchison Bros.,** 1315 Pacific St., Dallas, Tex. (sponsors) cancelled bids to have been opened Apr. 16, 600 HOUSING units, RANDOLPH FIELD (San Antonio), TEX. Will re-advertise. CD 4/9.

▲ **Snyder Consolidated Independent School Dist.,** Snyder, Tex., cancelled bids to have been opened Apr. 10, 120,000 sq. ft. HIGH SCHOOL, SNYDER, TEX. CD 3/7.

▲**Kirchof Constr. Co.,** 700 Lawrence St., Denver, Colo., Low Bidder, **$1,304,763,** general constr. and **McCarty Johnson** 944 Osage St., Denver, Colo., **$331,798,** plumbing and heating, main arena, exhibition bldg., city auditorium imprvs., Unit 1, Schedule 4, DENVER, COLO. City and Denver Co., City and County Bldg., Denver, Colo. Bids Apr. 5.

CONTRACTS—HEAVY CONSTRUCTION

† **Pennington-Winter Constr. Co.,** Apco Tower, Oklahoma City, Okla. Contract Awarded, **$888,627,** clearing Lot 4, in Bull Shoals Reservoir Area, Inv. CIVENG 03-050-51-41, ARKANSAS. U. S. Eng., 300 Broadway, Little Rock, Ark. Bids Mar. 20. CD 3/27, Under LB.

Sioux Valley Empire Electric Assn., Inc., Colman, S. D. Own Forces. **$578,000.** rebuilding rural distr. lines, towns of Humboldt, Hartford, Colton and Chester, SOUTH DAKOTA. CD 12/19/50.

▲† **Edward Peterson Co.,** 903 WOW Bldg., Omaha, Neb.; **Foley Bros., Inc.,** 900 New York Bldg., St. Paul, Minn., and **Tellepsen Constr. Co.,** P. O. Box 2536, Houston, Tex. Contract Awarded. **$5,576,725.** construction spillway, outlet structures, dike and dam closure of **Texarkana** Dam, approx. 10 mi. southwest of Texarkana, Tex. Inv. No. 51-146, TEXAS. U. S. Eng., foot of Prytania St., New Orleans, La. Bids Mar. 28. CD 4/2, under LB.

▲ **Texas-New Mexico Pipe Line Co.,** 720 San Jacinto St., Houston, Tex. Own Forces. **$1,125,000.** 75 mi. 8 in. crude oil line from producing areas in Midland Co. to connecting outlets at Midland, Approx. **$585,000,** 55 mi. 8 in. crude oil lines from vicinity of Crane to McElroy area, TEXAS.

H. Z. Zachry Co., P. O. Box 2570, San Antonio, Tex. Contract Awarded, **$752,767,** 18- to 72-in. concrete storm sewers, MIDLAND, TEX. Midland Co., Court House, Midland, Tex. Bids Mar. 30. CD 4/4, under LB.

Levington Shipbuilding Co., Orange, Tex. Own Forces. **$580,000.** docks, plant imprvs., ORANGE, TEX. CD 3/23.

† **Linbeck Constr. Corp.,** 1532 Peden St., Houston, Tex. Contract Awarded, **$505,000,** incl. alt. two mess halls, Lakeland Air Force Base, Inv. No. Eng 41-240-51-40, SAN ANTONIO, TEX. U. S. Eng., 606 Santa Fe Bldg., Galveston, Tex. Bids Mar. 27, awarded Apr. 5. CD 3/21, under LB.

CONTRACTS—BUILDINGS

L & M Constr. Co., 843 Vance Ave., Memphis, Tenn. Contract Awarded, **$600,000.** 5 story HOSPITAL ANNEX, JONESBORO, ARK. St. Bernard's Hospital, Jonesboro, Ark. CD 11/29, under LB.

Bollinger Constr. Co., Braniff Bldg., Oklahoma City, Okla. Contract Awarded, **$559,000,** est. $500,000. remodel Holmberg HALL at University of Oklahoma, NORMAN, OKLA. University of Oklahoma, Norman, Okla. Noftsger & Lawrence, 2756 N.W. 23 St., Oklahoma City, Okla., archts. Awarded Apr. 3.

S. B. Swiegert, 722 Speight St., Waco, Tex. Contract Awarded, **$652,161,** est. $650,000, 5 story HOSPITAL, WACO, TEX. Hillcrest Memorial Hospital, Waco, Tex. Bids Mar. 27. CD 4/3, under LB.

FAR WEST

BIDS ASKED—HEAVY CONSTRUCTION

STATE HIGHWAY LETTINGS

BRIDGES
May 2, California

STREETS AND ROADS
May 2, California — May 3, California

▲ **Calif., Salinas**—B.A. 5/1—Seaside County Sanitation Dist., Court House, sanitary sewer collection sys., treatment plant, at Seaside, Proj. 1, system; Proj. 2, treatment plant. $1,500,000. Plans deposit $50 each. H. F. Cozzens, Court House, engr. Harry N. Jenks, 63 Crescent Dr., Palo Alto, consult. engr. CD 5/2/50.

BIDS ASKED—BUILDINGS

▲ **Calif., San Jose**—HOSPITAL—B.A. 4/26—O'Connor Hospital, Race and West, San Carlos St., San Jose, Calif., 4 story hospital. $3,600,000. F. T. Georgeson, 355 Stockton St., San Francisco, Calif., archt. CD 8/8/50.

▲ **Wash., Whidbey Island**—APARTMENT UNITS—B.A. 4/27—Pub. Wks. Div., 13th Naval Dist., 1611 W. Wheeler St., Seattle, Wash., construct, manage and finance 300 apartment units at Naval Air Base, with 46 two story bldgs, on concrete slab, concrete, masonry. $2,700,000. Plans deposit $70. Stuart & Durham, 1100 Denny Way, Seattle, Wash., archts. CD 11/14.

▲† **Wash., Richland**—RADIOCHEMISTRY—B.A. 5/3—General Electric Co., Richland, prime contractor to Atomic Energy Comn., 195x272 ft. bsmnt. and 1st floor, 116x195 ft. second floor, steel, rein-con. radiochemistry bldg. at Hanford Works, with air-conditioning. $4,000,000. Plans deposit $50. L. S. Rosener, 233 Sansome St., San Francisco, Calif., engr. CD 4/2.

▲ **Utah, Salt Lake City**—PLANT—Bids Asked—Phillips Petroleum Co., Bartlesville, Okla., catalytic cracking plant unit. $10,000,000. CD 4/5.

LOW BIDDERS—HEAVY CONSTRUCTION

▲ **Western Electric Co,** White-Henry-Stuart Bldg., Seattle, 1, Wash. Low Bidder. **$1,195,319,** four 50,000 kva transformers, TACOMA, WASH. City, City Hall, Tacoma, Wash. J. F. Ward, city light supt.

† **Lee Hoffman,** 535 S. E. Water St., Portland, Ore. Low Bidder, $627,155. Construct double circuit section, Maupin-Detroit 230 kv. line, Inv. 5666, Marion Co., OREGON. Bonneville Power Admin., 827 N. E. Oregon St., Portland, Ore. Bids April 6.

Fresno Co., Court House, Fresno, Calif., rejected bids, COURT HOUSE alterations, FRESNO, CALIF. L.B. **$697,000.** CD 3/7, under LB.

LOW BIDDERS—BUILDING

▲ **W. C. Smith, Inc.,** 2119 Pacific Ave., Long Beach, Calif., Low Bidder. **$1,258,512,** physical EDUCATION BLDG. at Polytechnic High School, LONG BEACH, CALIF. Bd. Educ., 715 Locust Ave., Long Beach, Calif. Bids Apr. 5. CD 2/7.

▲ **Parker, Steffens & Pearce,** 135 S. Park St., San San Francisco, Calif. Low Bidder. **$1,393,300.** Constr. San Carlos-Belmont HIGH SCHOOL, REDWOOD CITY, CALIF. Sequoia Union High School Dist., Redwood City, Calif. Bids Apr. 4. CD 3/21.

▲ **Carrico & Gautier,** 365 Ocean Ave., San Francisco Calif. Low Bidder. **$1,517,000.** MUSIC and SPEECH bldg., San Francisco State College, SAN FRANCISCO, CALIF. State Div. Architecture, Pub. Wks. Bldg., Sacramento, Calif. Bids Apr. 3. CD 3/8.

CONTRACTS—HEAVY CONSTRUCTION

▲† **F. E. Wilder,** Olympia, Wash. Contract Awarded. $510,717. Schedule 1; **Smith Bros.,** Vancouver, Wash., **$533,439.** Schedule 2, Midway-Grand Coulee No. 3, 230 kv. transmission line, Benton, Grant, Douglas and Okanogan Counties, WASHINGTON. Bonneville Power Admin., 727 N.E. Oregon St., Portland, Ore. Bids Mar. 29, awarded Apr. 5. CD 4/9, under LB.

▲† **J. A. Terteling & Sons, Inc.,** 4011 Fairview Ave., Boise, Idaho, Contract Awarded, **$3,490 304,** earthwork, structures for East Low Canal, Station 2090 plus 75 to 2980 plus 00 and Lind Coulee Wasteway Station 0 plus 00 to 30 plus 00, Columbia Basin Proj., Spec. DC-3315, WASHINGTON. Bureau Reclamation, Ephrata, Wash. Bids Mar. 22, awarded Apr. 3. CD 4/4, under LB.

CONTRACTS—BUILDINGS

▲ **Strand & Sons,** 3939 University Way, Seattle, 5, Wash., Contract Awarded, **$1,466,500,** general constr., **Navarre Plumbing & Heating Co.,** 3839 Stone Way, Seattle, 4, Wash., **$527,346.** mechanical work, for 385x586 ft., rein.-con. David D. Denny Junior High SCHOOL, SEATTLE, WASH. School Dist. 1, 815 4 Ave. N., Seattle, Wash. Bids Apr. 4. CD 4/10, under LB.

▲ **Modern Home Builders, Inc.,** 3849 34 Ave. W., Wash. Day Labor. **$365,000,** 39 HOUSES in 3600-3800 blocks on 48-48 Aves. S. W., SEATTLE, WASH. CD 4/4.

▲ **Kaiser Engineers,** 1206 S. Maple St., Los Angeles, Calif. Contract Awarded. **$24,545,000.** 200 ton open hearth FURNACE, soaking pits, cold reduction MILL, hot dip tinning pots, electrolytic tinning line, and all equipment to mfg. steel ingots, hot dipped tin and electrolytic plate, FONTANA, CALIF. Kaiser Steel Corp., Fontana, Calif. CD 10/20/48.

Cahill Bros., 206 Sansome St., San Francisco, Calif. Owner Builds, **$820,000,** 6 story OFFICE, Sansome and Sacramento Sts., SAN FRANCISCO, CALIF. Frederick H. Meyer & Albert J. Evers, 149 California St., San Francisco, Calif., archts.

▲ **I. C. Curry,** 1701 B St., San Diego, Calif. Contract Awarded. **$1,604,104,** est. $1,250,000. Intermediate SCHOOL, LA MESA-SPRING VALLEY, CALIF. La Mesa Spring Valley School Dist., Heller Bldg., La Mesa, Calif. Bids Mar. 21. CD 3/27, under LB.

ALASKA

BIDS ASKED—HEAVY CONSTRUCTION

▲† **Alaska**—RAILROAD GRADE, etc.—B. A. 4/30—The Alaska Railroad, Dpt. Interior, Anchorage, 2.2 mi. railroad grade and track on Seward-Portage run. $1,000,000. Plans deposit $10. CD 3/8.

BIDS ASKED—BUILDINGS

▲ **Alaska, Fairbanks**—HOUSING—B. A. 5/8—Alaska Housing Auth., 11 and I Sts., Anchorage, 75 dwelling units in 2 story frame bldgs. with combination community bldg. and boiler plant, etc. $1,000,000. Plans

deposit $35. Alaska Architectural & Eng., Fairbanks engr. Miller & Ahlson, 1410 Hubble Pl., Seattle, Wash., archts. CD 4/2.

LOW BIDDERS—HEAVY CONSTRUCTION

† **A. J. Hopper Co.,** Anchorage, Alaska. Low Bidder. $713,360, est. $542,394. 2 battalion headquarters and supply bldgs. at Ladd Air Force Base and one battalion headquarters and supply bldg. at Eielson Air Force Base. Inv. No. S95-507-51-69, ALASKA. U. S. Eng., APO 942, c/o PM, Seattle, Wash.), Anchorage, Alaska. Bids Apr. 5. CD 3/28.

CANADA

BIDS ASKED—HEAVY CONSTRUCTION

Que., St. Hubert—QUARTERS—B.A. 4/24—M. P. McAndrew, engr., Defense Constr. Ltd., 1247 Guy St., Montreal, three officers' quarters, one N. C. O. quarters and one OR quarters at R. C. A. F. Station. Approx. $700,000. Plans deposit $50.

▲ **Ont., Niagara Falls**—HYDRAULIC TUNNEL—B.A. 5/1—Robt. H. Saunders, chn. and Members Hydro-Electric Power Comm. of Ontario, 620 University Ave., Toronto, 4 sections hydraulic tunnel in connection with new Sir Adam Beck-Niagara Generating Station 2, to carry water from an intake above the Horseshoe Falls to point near Whirlpool Rapids, about 5½ mi. in all, each section approx. 6,255 ft. long, circular cross section, concrete lined, 45 ft. diam. Approx. $10,000,000. Plans deposit $1,000. CD 9/5/50.

BIDS ASKED—BUILDINGS

N. B., St. Stephen—HOSPITAL UNIT—B.A. 4/23—S. D. Graville, treas., Bd. Trustees, Charlotte County Hospital, St. Stephen, 44x176 ft., T-shaped main wing and 44x76 ft., shorter wing, hospital unit, Approx. $800,000. Plans deposit $50. Govan, Ferguson, Lindsay, Kaminker, Maw, Langley & Keenleyside, 515 Jarvis St., Toronto, Ont., archts. CD 7/27

N. B., Fairville—SCHOOL—B.A. 4/25—Parish of Lancaster School Trustees, Fairville, 19 classroom school with gymnasium and auditorium, $500,000. Alward & Gillies, Market Square, St. John, archts. CD 2/5.

LOW BIDDERS—HEAVY CONSTRUCTION

Curran & Briggs Ltd., 61 Haverson Blvd., Toronto, Ont. Low Bidder. Approx. **$999,213.** Third Phase of Mountain Trunk Sewers, 7,038 ft. tunnel sewer on Fennell, Gage Sts. and auxiliary works, 9x9½x10x10½ and 4x5 ft., on Gage Ave., HAMILTON, ONT. City, J. F. Berry, city clk., City Hall, Hamilton, Ont. Bids Apr. 5. CD 3/19.

J. P. Porter Co. Ltd., 1010 St. Catherines St. W., Montreal, Que. Low Bidder. **$694,364,** wharf, SEPT ISLES, QUE. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Apr. 4. CD 3/21.

LOW BIDDERS—BUILDINGS

Ball Brothers Ltd., 49 King St. E., Kitchener, Ont. Low Bidder. Approx. **$500,000.** 1 story H-shaped, steel, brick 2 wing SCHOOL, South St. between Blake and Bennett Sts., GODERICH, ONT. District Collegiate Bd., Goderich, Ont. Bids Mar. 20. CD 3/6.

Quemont Constr., Inc., 285 Bernard St. W., Montreal, Que. Low Bidder. Approx. **$509,250.** 3 story, 50x106 ft., concrete, brick, PUBLIC BLDG., RIMOUSKI, QUE. Dpt. P. Wks., Hunter Bldg., Ottawa, Ont. Bids Apr. 4. CD 3/26.

CONTRACTS—BUILDINGS

▲ **Christensen & Macdonald,** 612 Tegler Bldg., Edmonton, Alta. Contract Awarded, **$1,900,000,** est. $1,500,000, superstructure 6 story, bsmnt., 45x250 ft., rein.-con., brick, 200-bed hospital, EDMONTON, ALTA. Edmonton General Hospital, Edmonton, Alta. Awarded Jan. 9. CD 3/29.

▲ **Tope Constr. Co., Ltd.,** 677 Main St. W., Hamilton, Ont., Contract Awarded, **$2,183,320,** main wing part 5 and part 4 story, 42x419 ft., 322-beds, Henderson Convalescent HOSPITAL on Mountain Hospital Grounds, HAMILTON, ONT. City, J. F. Berry, clk., City Hall, Hamilton, Ont. Bids Mar. 9. CD 4/4, under LB.

▲ **George Hardy Ltd.,** 163 Wicksteed Ave., Toronto, Ont. Contract Awarded. Approx. **$1,250,000,** general constr. 3 story, 52x252 ft., 52x147 ft., brick, steel home for aged, North Bathurst St., TORONTO, ONT. Jewish Home for the Aged, 150 Beverly St., Toronto, Ont. Bids Dec. 15, awarded Apr. 10. CD 11/21.

Komo Constr. Ltd., 1500 St. Vallier St., Quebec City, Que. Contract Awarded. Approx. **$750,000.** 6 story COLLEGE addn., LEVIS, QUE. College de Levis, Levis, Que. R. Blanchet, 53 d-Anteuil St., Quebec City, Que., archt.

Angus Robertson Ltd., 5035 Western Ave., Montreal, Que. Contract Awarded, **$500,000** SCHOOL Addn., St. EUSTACHE QUE. Protestant School Comm., St. Eustache, Que. CD 2/26, under LB.

ALASKA

CONTRACTS—BUILDINGS

▲ **Arthur G. McKee & Co.,** 2300 Chester St., Cleveland, O., U.S.A. Contract Awarded, **$14,900,000.** LUBRICANTS PLANT, SALAMANCA, MEXICO. Petroleos Mexicanos, Juarez, 104, Mexico City, Mexico. Awarded Apr. 5. CD 1/4.

OFFICIAL PROPOSALS

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3373) will be received by Bureau of Reclamation, Bismarck, North Dakota, until May 1, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of Bismarck-De Vaul 69-kilovolt transmission line, Missouri River Basin Project, North Dakota. The work is situated near Bismarck, North Dakota. The transmission line will be 68 sky., 3-phase, single-circuit, wood-pole, H-frame type, approximately 45 mi. long, and will include a river crossing, approximately 0.6 mi., on 4 steel towers. Contractor is to furnish all materials. Time allowed for completion will be 200 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 1-A, Denver Federal Center, Denver, Colorado.

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3380) will be received by Bureau of Reclamation, Casper, Wyoming, until May 3, 1951, and then publicly opened for furnishing labor and materials and performing all work for the construction of Sinclair-Hanna 34.5-kilovolt transmission line, Kendrick Project, Wyoming. The work is situated between Sinclair and Hanna, Wyoming. The transmission line will be a 34.5-k. 3-phase, single-circuit, wood-pole line in 3 sections totaling approximately 28 mi. Contractor is to furnished all materials except poles. Time allowed for completion will be 180 days. For particulars, address Bureau of Reclamation, Casper, Wyoming; or Building 1-A, Denver Federal Center, Denver, Colorado.

OFFICIAL PROPOSALS

Bids: May 21, 1951

Storm Drain Work

Sealed proposals will be received at the office of the City Clerk, City Hall, Pontiac, Michigan until 4 o'clock P.M. (Eastern Standard Time) of Monday, May 21, 1951, at which time the bids will be publicly opened and read by the Clerk and the rates of bids for the different items noted, for the following work:

Remove portion of existing wall at Sta. 1+14.05-S. Side, Lump Sum; Retaining wall in place, as per plan, 604 lin. ft.; Variable height retaining wall, as per plan, 60.88 lin. ft.; Porous backfill for retaining walls, in place, 492 cu. yd.; Concrete closing wall, each; 7 ft. x 6' Dual box section, as per plan, 286 lin. ft.; Junction Chamber—Sta. 3+00, 1 each; 9'6" or 10' R.C.P. in open cut, Sta. 3+19 to Sta. 6+00 and Sta. 20+00 to Sta. 30+64, 1345 lin. ft.; 9'6" or 10' R.C.P. in open cut—Sta. 6+00 to Sta. 9+00 and Sta. 17+50 to Sta. 20+00, 500 lin. ft.; 9'6" or 10' R.C.P. and Cradle in open cut Sta. 9+00 to Sta. 17+50, 850 lin. ft.

Alternate for above item:

9'6" or 10' Monolithic Concrete in tunnel, including necessary shafts, 850 lin. ft.; Inlet Structure, 1 each; Sanitary trunk sewer reinforcement Sta. 2+65, 35 lin. ft.; Sanitary trunk sewer reinforcement Sta. 11+00, 20 lin. ft.; Deep Manhole on 9'6" or 10' pipe, 2 each; Standard Manhole on 9'6" or 10' pipe, 6 each; Standard Inlet, 4 each; Standard Manhole, 2 each; Rebuild Inlet, 1 each; 8" Vit. S. P. Sanitary Sewer, 195 lin. ft.; Standard Manhole—Sanitary, 2 each; Drop structure for Sanitary manhole, 1 each; 6" Risers—type "A" & Connect, 6 each; Bulkhead Exist. 8" Sanitary Sewer, 1 each; 15" Storm Drain, 42 lin. ft.; 12" Inlet Connection, 100 lin. ft.

The City of Pontiac, reserves the right to reduce the quantities of work, in the contract, involved in the construction of retaining walls. The City of Pontiac reserves the right to order the walls to be built only from Sta. 3+01.72 RT to Sta. 3+84.16 RT and from Sta. 3+53.72 LT to Sta. 3+84.16 Lt.

The Plans and Specifications for the work may be examined at the office of the City Engineer, Pontiac, Michigan, or copies may be obtained by making a deposit of Ten Dollars, which will be refunded upon their return in good condition within five days from date of bidding.

A certified check or bid bond for a sum not less than 5% of the amount of the proposal will be required with each proposal as a guarantee of good faith and the same to be subject to the conditions stipulated in the instructions to bidders.

The right to accept any proposal, to reject any or all proposals, and to waive defects in proposals is reserved by the City.

By Order of the Commission,
ADA R. EVANS, City Clerk.
LEWIS M. WRENN,
City Engineer

Bids: May 9, 1951

Nurses' Home

ONONDAGA COUNTY HOME
Onondaga Hill, New York

SEALED PROPOSALS will be received until 2:00 P.M., E.D.T., May 9, 1951, by Robert W. Sollinger, County Purchasing Agent, in Room 107 at the Onondaga County Court House, Syracuse, New York, at which time and place they will be publicly opened and read aloud, for the construction of the above project.

Sealed Proposals shall be received for the following divisions of the work:

Contract No. 1—General Construction
Contract No. 2—Plumbing and Sanitary System
Contract No. 3—Heating and Ventilating
Contract No. 4—Electric Wiring System
Contract No. 5—Elevators, and Elevator Fronts and Doors

The Instructions to Bidders, Forms of Proposal, Form of Contract, Drawings and Specifications may be examined in the office of the County Purchasing Agent and at the Office of the Architects, Vedder and Curtin, A.I.A., 527 South Warren Street, Syracuse, New York. The above Documents shall also be on file for examination by prospective Bidders, Sub-Contractors and Materialmen, as follows:

Syracuse Builders' Exchange, Durston Bldg., Syracuse, N. Y.
Rochester Builders' Exchange, Rochester, N. Y.
Albany Builders' Exchange, Albany, N. Y.
Buffalo Builders' Exchange, Buffalo, N. Y.
Brown's Letters, 101 Park Avenue, New York City
Dodge Reports, 110 West 40th St., New York City
Dodge Reports, 361 Delaware Avenue, Buffalo, N. Y.

Sets of the above Documents are obtainable from the County Purchasing Agent by depositing $50.00 for each set. Those who submit a Sealed Proposal for Prime Contracts to the County of Onondaga for this Project will be refunded their deposits in full if the Documents are returned in good condition on or before May 14, 1951. Others who receive the above Documents will be refunded one half of their deposits if the Documents are returned in good condition on or before May 14, 1951.

The right is reserved to reject any and all bids.

Robert W. Sollinger
Onondaga County
Purchasing Agent

April 4, 1951
Syracuse, New York

(Continued on page 86)

READ THE OFFICIAL PROPOSAL COLUMNS OF
ENGINEERING NEWS-RECORD
THIS WEEK AND EVERY WEEK

OFFICIAL PROPOSALS

RATE: THE RATE FOR OFFICIAL PROPOSAL ADVERTISING IS $1.25 PER LINE (OR FRACTION) PER INSERTION.

COPY RECEIVED UP TO 3:00 P. M. THURSDAY FOR ISSUE OUT FOLLOWING THURSDAY SUBJECT TO SPACE OPEN FOR LAST MINUTE ADS

SEND COPY TO OFFICIAL PROPOSAL DIVISION, ENGINEERING NEWS-RECORD, 330 W. 42ND ST., NEW YORK 18, N. Y.

(Continued from page 85)

Bids: May 2, 1951

New Jersey Turnpike Authority

Sealed proposals will be received by the New Jersey Turnpike Authority for:

CONTRACTS NOS. 80, 80A and 80B

The work to be done under these Contracts involves the construction of two types of right of way fence, namely, chain-link fence and farm-field fence and other work incidental thereto, all in connection with the construction of the New Jersey Turnpike. This work extends from the southern terminus of the Turnpike at Deepwater to the Mercer-Middlesex County line at the Millstone River. The division of work between Contracts 80A and 80B is at the Camden-Burlington County line. Contract 80A including all work in Salem, Gloucester and Camden Counties, and Contract 80B including all work in Burlington and Mercer Counties.

The approximate length of each type of fence to be constructed under Contracts Nos. 80A and 80B are:

Contract No. 80A

Chain-Link Type Fence	200 lin. ft.
Farm-Field Type Fence	377,000 lin. ft.

Contract No. 80B

Chain-Link Type Fence	400 lin. ft.
Farm-Field Type Fence	400,000 lin. ft.

The approximate length of each type of fence to be constructed under Contract No. 80 is equal to the sum of the lengths listed for ContractsNos. 80A and 80B.

Bidders are hereby advised that the Authority has placed orders with various manufacturers for supplying the chain-link type fence, including all posts, bracing, pedestrian and vehicular gates, and all appurtenances therefor, and further that the Authority may, at its option and own convenience, furnish part of the farm-field type fence to the Contractor.

Proposals will be received at the office of the New Jersey Turnpike Authority, 65 Prospect Street, Trenton 8, New Jersey until 10:30 o'clock, Eastern Standard Time on the morning of May 2, 1951, and thereafter in the Veteran's Room of the War Memorial Building, Memorial Drive at Willow Street, Trenton, New Jersey, until 11:00, A.M., Eastern Standard Time, on the same date, at which latter time and place said proposals will be publicly opened and read.

The receipt and opening of proposals is subject to proper prequalification of the bidder in accordance with the regulations adopted by the New Jersey Turnpike Authority. Bidders must also submit with their Proposal a revised financial statement and a statement of plant and equipment.

Contract documents may be seen, and may be inspected by prospective bidders during office hours, after April 12, 1951, at the office of the New Jersey Turnpike Authority, 65 Prospect Street, Trenton 8, New Jersey and at the office of the Consulting Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York, New York.

Contract documents will be furnished for $5.00 for each set, upon application to the Authority. The payment will not be refunded and contract documents are not required to be returned.

Proposals must be made upon the standard proposal forms in the manner designated in the Standard Specifications, for Construction of the New Jersey Turnpike, and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and the number of the contract on the outside, and must be accompanied by a certified check drawn to the order of the New Jersey Turnpike Authority and a proposal bond, each for not less than five (5) per cent of the amount of the proposal, but not less than $500.00 nor more than $200,000.00 and must be delivered at the place designated above on or before the hour named. Where proposals are submitted for more than one contract, one check an done bond based on the largest amount of work included in a single proposal will be sufficient. Copies of the proposal form to be used for submitting proposals, of the form for the proposal bond, of the form to be used for the financial statement and for the plan and equipment statement to be submitted with the proposal and of the special addressed envelope are furnished in detached form with the contract documents. Bidders submitting proposals on more than one of the above contracts are required to submit only one financial statement and only one statement of plant and equipment.

The Contract will be awarded or the proposals rejected within fifteen (15) days from the date of opening proposals. The right is reserved to reject any or all proposals.

THE NEW JERSEY TURNPIKE AUTHORITY
Paul L. Troast
Chairman
April 10, 1951

Bids: May 1, 1951

THE HYDRO-ELECTRIC POWER COMMISSION OF ONTARIO

SIR ADAM BECK-NIAGARA GENERATING STATION NO. 2
TENDERS FOR CONSTRUCTION OF HYDRAULIC TUNNEL

Sealed tenders, in duplicate, addressed to the undersigned and clearly marked "Tender for Hydraulic Tunnel, Section No. ——, Sir Adam Beck-Niagara Generating Station No. 2" will be received up to 4 p. m. Eastern Standard Time

Tuesday, May 1st, 1951

for the construction of any or all of the four Sections of Hydraulic Tunnel, each approximately 6,225 feet in length, of circular cross-section, concrete-lined, with 45 feet finished diameter. The principal features of the work to be performed in each Section comprise:—one work shaft, excavation of tunnel, installation of structural steel support, construction of concrete lining reinforced where required, grouting of rock and behind concrete lining wherever necessary, and dewatering of the work.

Copies of Form of Agreement, Information for and Instructions to Tenderers, General Conditions and Specification, Plans, Form of Tender and Labour Agreement may be obtained on or after March 30th, 1951 from the Director of Supply, 620 University Avenue, Toronto, Ontario, upon payment of a deposit in the amount of $1,000.00 per set, which amount will be refunded upon submission of a tender accompanied by the required security. If no such tender is submitted but the documents are returned in good order $750.00 of the said deposit will be returned. Failing return of the documents in good order the Commission will retain the full amount of the deposit.

Each tender for each Section of the Hydraulic Tunnel must be accompanied by a certified cheque on a Canadian Chartered Bank for the sum of Five Hundred Thousand Dollars ($500,000.00) payable to the order of the Commission. The Tenderer to whom a contract is awarded shall be required to provide a performance bond satisfactory to the Commission for fifty per cent (50%) of its tender price. Each certified cheque, furnished by each Tenderer, will be retained by the Commission until the contract for the Section to which it applies has been executed and the required performance bond has been furnished. As soon as possible thereafter, the certified cheques of the unsuccessful tenderers will be returned. If a Tenderer after being awarded a contract for a Section, refuses to execute the contract or fails to furnish the required performance bond, Two Hundred and Fifty Thousand Dollars ($250,000.00) of the proceeds of the certified cheque of such Tenderer shall be forfeited to the Commission as ascertained and liquidated damages and the balance returned. If a successful tenderer fulfills the obligations as to executing a contract and furnishing a performance bond, its certified cheque will be returned.

The lowest or any tender will not necessarily be accepted.

Robert H. Saunders, C.B.E., K.C.,
Chairman, and Members of The
Hydro-Electric Power Commission of Ontario,
620 University Avenue,
TORONTO 2, Ontario.

U. S. Government

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. NOTICE IS HEREBY GIVEN that sealed bids on Invitation No. 7038-180 will be received at P. O. Box 280, Reclamation Center, Casper, Wyoming, until 10 A.M., Mountain Standard Time, May 1, 1951, and then publicly opened for furnishing and delivering Transformers, Lightning Arresters, Regulator, and Switching Equipment for Ogallala Substation, Transmission Division, Nebraska, Missouri River Basin Project.

Copies on the standard forms and of the specifications may be obtained from the following offices of the Bureau of Reclamation: Avery A. Batson, Regional Director, New Customhouse, Denver, Colorado, and I. J. Matthews, District Manager, P. O. Box 280, Casper, Wyoming. No charge to prospective bidders for copies of the specifications; to others $0.25 per copy, not returnable.

(Continued on page 87)

Engineering News-Record

Reaches Your Local Contractors

Its distribution among the contractors of any one state is in proportion to the number of contractors situated in that state. The Official Proposal Columns of *Engineering News-Record* offer precisely the same efficient service to municipalities, counties, state and federal departments in every section of the United States.

U. S. Government
(Continued from page 86)

UNITED STATES DEPARTMENT OF THE INTERIOR, Bureau of Reclamation. Sealed bids (Specifications No. DC-3382) will be received by Bureau of Reclamation, Bismarck, North Dakota, until May 10, 1951, and then publicly opened for furnishing labor and materials and performing work for the construction of Garrison-Ft. Peck tie, 115-kilovolt transmission line, Central North Dakota System, Missouri River Basin Project. The work is situated in the vicinity of Garrison Dam, North Dakota. The line will be 115-kv., 3-phase, single-circuit, without overhead ground wires and approximately 3.8 mi. long, of which 2.9 mi. will be wood-pole, H-frame type and 0.9 mi. will be a Missouri River crossing on 4 steel towers. All materials to be furnished by the contractor, except steel for towers. Time allowed for completion will be 180 days. For particulars, address Bureau of Reclamation, Bismarck, North Dakota; or Building 1-A, Denver Federal Center, Denver, Colorado.

Bids: May 15, 1951

Airlines Terminal & Parking Garage

TRIBOROUGH BRIDGE AND TUNNEL AUTHORITY

SEALED BIDS WILL BE RECEIVED BY the Triborough Bridge and Tunnel Authority's Administration Building, Randall's Island, New York 35, N. Y., as follows:

Until 11.00 a.m. daylight saving time, on TUESDAY, MAY 15, 1951

For the construction of East Side Airlines Terminal and Public Parking Garage located 37th to 38th Streets and First Avenue, Borough of Manhattan.

Deposit required for specifications, etc., $75 for each set.

The information for bidders, form of contractor's bid, form of contract, the specifications, the plans and the forms of performance and labor and material bonds may be examined at the office of the Architect, John B. Peterkin, 36 West 44 Street, New York, N. Y. and copies thereof may be obtained upon deposit for a set, of the amount hereinabove specified, to be refunded upon return of the plans and documents in good condition within 30 days after the opening of bids.

Bids: May 9, 1951

George Washington Bridge West 179th Street Tunnel Tunnel Finish

READVERTISEMENT

THE PORT OF NEW YORK AUTHORITY

CONTRACT GWB-120.017

Sealed proposals for the interior finish for the West 179th Street Tunnel, New York City, will be received at the office of the Chief Engineer of The Port of New York Authority, Room 1100, 111 8th Ave., New York 11, until 2 P.M. Wednesday, May 9, 1951, and thereafter in the Auditorium of the Authority at the same address until 2:45 P.M., on the same date, at which latter time and place said proposals will be publicly opened and read.

Contract documents may be seen at the office of the Chief Engineer and copies will be furnished upon deposit of $25 per set. The deposit will be remitted if the documents are returned in good condition, not later than 30 days after the opening of proposals.

THE PORT OF NEW YORK AUTHORITY
Howard S. Cullman, Chairman

New York, April 19, 1951

Bids: May 2, 1951

Construction of Route 25

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 25, SECTION 5E

Construction of Route 25, Section 5E, Old Post Road Intersection Improvement at Station 150+0, Township of Woodbridge, Middlesex County.

Estimated:
1,020 cu. yds. Roadway Excavation—Earth
2,040 sq. yds. 9" Plain Conc. Pavement Surface
2,100 lin. ft. White Concrete Curb
Installation of Underground Elec. System—Lump Sum

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Wednesday, May 2, 1951, at ten o'clock (10:00 A.M. — EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: May 2, 1951

Removal of Bridge

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

REMOVAL OF EXISTING MANASQUAN RIVER BRIDGE

Removal of existing bridge over Manasquan River, Dredging and Construction of timber bulkheads, on Route 35, Section 4G, Boroughs of Brielle and Point Pleasant Beach, Monmouth and Ocean Counties. The work consists of the removal of the entire superstructure of the existing bridges over Manasquan River and Wills Hole Thorofare, the removal of eight (8) piers and one (1) abutment, the excavation of stream channel and roadway embankment, the construction of timber bulkheads and incidental work. The principal items of construction are:

Estimated:
Removal of Existing Structures
825 lin. ft. Treated Timber Piles
2.5 M.B.M. Timber in Bulkheads
3,100 sq. ft. Bulkhead Sheeting
30,040 cu. yds. Excavation—Unclassified

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Avenue, Trenton, New Jersey, on Wednesday, May 2, 1951, at ten o'clock (10:00 A.M. — EASTERN STANDARD TIME), eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening of bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Highway Commissioner. Bidders must also submit a revised financial statement and statement of plant and equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by Prospective Bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

Bids: May 2, 1951

Route Paving

STATE OF NEW JERSEY
STATE HIGHWAY DEPARTMENT
TRENTON

NOTICE IS HEREBY GIVEN that sealed bids will be received by the State Highway Commissioner for:

ROUTE 44, SECTION 10A

Paving on Route 44, Section 10A, from Bridgeport to Nortonville, Second (Southerly) Half of Divided Highway, Gloucester County. Length 2.179 miles.

Roadway Items

Estimated:
22,000 cu. yds. Roadway Excavation—Earth
15,500 cu. yds. Borrow Excavation
15,000 cu. yds. Subbase
5,036 sq. yds. Gravel Base Course
4,639 sq. yds. 3" Waterbound Mac. Inter. Course
561 tons Pavement, Type MA-BC-1
Alternative "A"
30,682 sq. yds. 10" Plain Concrete Pavement
Alternative "B"
29,894 sq. yds. 4" Waterbound Mac. Base Course
29,894 sq. yds. 6" Waterbound Mac. Inter. Course
4,588 tons Pavement, Type MA-BC-2
Bridge Items
162 cu. yds. Concrete in Structures
8,900 lbs. Reinforcing Steel in Structures
1,840 lin. ft. Timber Piles

Bids for the above will be received at the office of the State Highway Department, Assembly Room, Room 140, in the State Highway Office Building, 1035 Parkway Ave., Trenton, N. J., on Wednesday, May 2, 1951, at ten o'clock (10:00 A.M.—EASTERN Standard Time, eleven o'clock (11:00 A.M.—DAYLIGHT SAVING TIME), and will be opened and read immediately thereafter.

The receipt and opening bids is subject to the proper qualification of the bidder in accordance with the provisions of the prequalification law and the regulations adopted by the State Commissioner. Bidders must also submit a revised financial statement and statement of plant & equipment with their bid.

Drawings, specifications and form of bid, contract and bond for the proposed work are on file in the office of the State Highway Department, Trenton, N. J., and may be inspected by prospective bidders during office hours. Plans will be furnished on a deposit of Ten Dollars ($10.00) for each set of plans upon application to A. Lee Grover, Chief Clerk, State Highway Department, Room 139, State Highway Office Building, 1035 Parkway Avenue, Trenton, N. J. Bids must be made upon the standard proposal forms in the manner designated in the standard State Highway specifications and must be enclosed in sealed special addressed envelopes bearing the name and address of the bidder and work bid upon on the outside, and must be accompanied by a certified check drawn to the order of the Treasurer of the State of New Jersey for not less than ten percent (10%) of the amount of the bid, provided that the said certified check shall not be less than $500.00 nor more than $20,000.00 and must be delivered at the above place on or before the hour named. Copies of the standard proposal forms and special addressed envelopes will be furnished on application. Bids not enclosed in sealed special addressed envelopes will be considered informal and will not be opened. The right is reserved to reject any or all bids.

Signed: R. J. Abbott
State Highway Commissioner

(Continued on page 88)

U. S. Government
(Continued from page 87)

Office of the District Engineer, Corps of Engineers, U. S. Army 1217 U. S. Post Office and Custom House, St. Paul 1, Minnesota. —Sealed bids, in duplicate, for furnishing all labor and materials and performing all work required for Construction of Access Road and Improvement of Earth Dam at Marsh Lake Dam, Minnesota River, near Appleton, Minnesota, will be received in this office until 2:00 P.M., C.S.T., April 24, 1951, and then publicly opened. Further information upon application.

OFFICIAL PROPOSALS

Bids: April 23, 1951

Plumbing Work—New Toll Houses

THE DELAWARE RIVER JOINT COMMISSION

CAMDEN, NEW JERSEY

Sealed bids will be received upon Contract No. 17, "Plumbing Work for new toll houses of the Delaware River Bridge" at the office of the Secretary of The Delaware River Joint Commission, Administration Building, Bridge Plaza, Camden, New Jersey until 1:30 P. M. Eastern Standard Time, Monday, April 23, 1951 and then and there will be publicly opened and read.

A more complete description of the work and full information for bidders are given in the Contract Documents and Specifications for this Contract, which may be obtained upon a deposit of Ten Dollars ($10.00) which will be remitted upon receipt of bid or the return in good condition of the copies so taken within thirty (30) days after the opening of bids.

Each proposal must be accompanied by a certified or cashier's check, payable to The Delaware River Joint Commission in the amount of $2,500.00.

The check must be drawn upon a National or State Bank or Trust Company having an office either in Philadelphia, Pennsylvania or Camden, New Jersey and must not be enclosed with the sealed bid. The Surety's consent must be shown. The bidder to whom the contract is awarded will be required to furnish a Performance and Labor Materialmen's Bond in the sum of One Hundred percent (100%) for the Contract.

The Commission will afford prospective bidders an opportunity to inspect the site of the work.

The Commission reserves the right to waive any informalities in the bids received, to reject any or all bids; and to award the contract only to those expereinced in this class of work and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

THE DELAWARE RIVER JOINT COMMISSION
JOSEPH K. COSTELLO
Secretary

Bids: May 1, 1951

Contract No. 10 Electrical Installations

THE DELAWARE MEMORIAL BRIDGE

Sealed proposals for furnishing and installing electrical equipment for "The Delaware Memorial Bridge" over the Delaware River near Wilmington, Delaware, will be received by the Delaware State Highway Department at the office of the Director, Delaware Crossing Division, Continental American Building, Wilmington, Delaware, until 12 o'clock noon, Eastern Standard Time, May 1, 1951, at which time and place said proposals will be publicly opened and read.

The entire work involves furnishing and installing equipment for the following:

(1) 4160V primary service line from a terminal pole (installed by others) near the Administration Building to and including transformer stations and permanent power and light feeder to the Administration Building.
(2) Toll Area Series Lighting.
(3) Tower Power and Lighting Systems including feed for elevators.
(4) Navigation and Range Lights.
(5) Aviation Beacons.
(6) Bridge Roadway Series Lighting.
(7) Wireways for Telephone System.
(8) Anchorage Lighting.

OFFICIAL PROPOSALS

Work on Contract No. 10 shall begin promptly after the execution of the Contract. It shall be completed on or before December 31, 1951.

Monthly payments will be made for ninety (90) per cent of the construction completed each month.

Bidders must submit proposals upon forms provided by the Department.

Each proposal must be accompanied by an acceptable surety bond or certified check to the amount of at least ten (10) per cent of the total amount of the proposal.

The Contract will be awarded or proposals rejected within thirty (30) days from the date of opening proposals. The right is reserved to reject any or all bids.

The Plans and Specifications and other contract documents may be examined at the office of the Director, Delaware Crossing Division, and at the office of the Engineers, Howard, Needles, Tammen & Bergendoff, 55 Liberty Street, New York 5, N. Y. One complete set of the Plans and two copies of the Specifications may be obtained from the Engineers after April 6, 1951 upon payment of $15.00. Any prospective bidder who has made such a deposit may secure extra blueprint copies of the Plans upon payment of 50 cents per drawing, and extra copies of the Specifications upon payment of $2.50 per copy.

Plans and Specifications need not be returned to the Engineers, and the above payments will not be refunded.

State Highway Department
by: J. Gordon Smith, Chairman
W. A. McWilliams, Director
Delaware Crossing Division
April 3, 1951

Bids: April 27, 1951

Roadway Lighting

DELAWARE RIVER
JOINT TOLL BRIDGE COMMISSION
526 Broad Street Bank Building
Trenton 8, New Jersey

Sealed proposals for the installation of the Roadway Lighting for the Delaware River Bridge and Approaches between Morrisville, Pennsylvania and Trenton, New Jersey will be received by the Delaware River Joint Toll Bridge Commission at its Office, 526 Broad Street Bank Building, Trenton 8, New Jersey, until eleven o'clock (11:00) A.M.; Eastern Standard Time, on the 27th day of April, 1951, at which time and place all bids will be publicly opened and read aloud.

After Monday, April 2, 1951, Instructions to Bidders, form of Proposal, form of Contract, form of Performance Bond, Plans and Specifications may be examined at the office of the Commission, above address, or at the office of the J. E. Greiner Company, 1201 St. Paul Street, Baltimore 2, Maryland, and copies thereof obtained upon payment of a $5.00 deposit for each set. This deposit will be refunded upon the return of the documents in usable condition within 30 days after receipt of bids.

The work includes furnishing and installing the roadway lighting and lighted signs for approximately 5700 feet of roadway and bridges. The following are approximate quantities of the major items:—

Luminaires, ballasts, and lamps	135
Standards	120
Concrete Foundations for Light Standards and Signs	80
Brackets	125
Wire	60,000 L. F.
Transformers	3
Transite Conduit	10,000 L. F.

All checks shall be made payable to the Delaware River Joint Toll Bridge Commission, which amounts shall be forfeited as liquidated damages if the bidder or bidders fail, within ten (10) consecutive calendar days after written notice that the bidder or bidders have been awarded the contract, to enter into a written contract with the Commission in accordance with the accepted proposal and a Performance Bond satisfactory to the Commission, equal to one hundred percent (100%) of total amount of contract.

The Commission reserves the right to waive any informalities in the bids received; to reject any or all bids; and to award the contract only to those experienced in this class of work, and to the bidder whose proposal is deemed by the Commission to be most advantageous to the public interest.

DELAWARE RIVER JOINT TOLL BRIDGE COMMISSION
by: Alexander R. Miller
Chairman of Commission

Date, April 2, 1951

SEARCHLIGHT SECTION

Classified Advertising

EMPLOYMENT — BUSINESS EQUIPMENT — USED OR RESALE

OPPORTUNITIES

UNDISPLAYED RATE

$1.50 a line. Minimum 4 lines. Count 5 average words as a line. POSITIONS WANTED (full or part time salaried employment only), ½ above rates. In advance.
BOX NUMBERS—Care of publication, count as 1 line.

DISPLAYED RATE

Rate: $14.25 per inch for all advertising other than contract. Contract rates on request. AN ADVERTISING INCH: ⅞" on one column, 3 columns—30 inches—to a page.

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Blast Furnaces. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9382, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

DESIGNERS and DETAILERS REINFORCED CONCRETE

Defense Work. Work will be performed in Chattanooga, Tennessee. Salary and position commensurate with experience. Qualified Engineers contact:

AAKE F. HEDMAN
Consulting Engineer
Chattanooga, Bank Building
Chattanooga, Tennessee

Engineer

OFFICE ENGINEER

The Atlantic Refining Company of Brazil requires an Engineer with demonstrated ability to handle such office assignments as: supervision of detailing, estimating construction and maintenance costs, writing specifications and ordering construction materials, electrical and mechanical equipment. Experience on petroleum products, bulk storage and sales facilities desired. Minimum of 5 years' office engineering experience required. Starting salary depending on qualifications. Write stating education, experience and personal qualifications to

MR. E. T. ADDISON
The Atlantic Refining Co.
260 SOUTH BROAD STREET
PHILADELPHIA 1, PA.

CONSTRUCTION SUPERINTENDENT

Experienced in construction of Open Hearth Plants. Must be a good organizer, able to handle labor and qualified to exercise executive ability. Compensation commensurate with ability of individual.

Write and furnish full information regarding education, training, chronological details of experience, age, salary expected, etc. All replies will be considered strictly confidential.

P-9381, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

SANITARY ENGINEERS DESIGNERS DRAFTSMEN

Experienced men wanted by Consulting Engineers Office—State qualifications age experience salary and date available in first letter. Replies held strictly confidential.

P-9385, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

WANTED

PROJECT ENGINEER

For Construction of

STEEL MILL FACILITIES

Minimum of 5 years' experience on heavy construction

Send complete resume

John Mohr & Sons

3200 E. 96th St. Chicago 17, Ill.

MECHANICAL ENGINEERS, DESIGNERS DRAFTSMEN for industrial plant equipment, chemical process piping, lay-out and detailing. **STRUCTURAL ENGINEERS-DESIGNERS** of steel, concrete structures in industrial work. **CIVIL ENGINEER—DESIGNER** experienced soil mechanics paving and drainage, pipe lines.

Send full particulars to:
JOHN J. HARTE CO.
284 Techwood Drive, Atlanta, Georgia

STRUCTURAL STEEL DRAFTSMEN DETAILERS AND CHECKERS
ONLY TOP RATE MEN
Write Qualifications
BERZIN, GEIST & LICHTENBERG
ENGINEERS
213 East 38 Street, New York 16, N. Y.

DESIGNERS, DRAFTSMEN, ELECTRICAL - MECHANICAL - STRUCTURAL. JOB LOCATED IN MIDDLE WEST. EXCELLENT WORKING CONDITIONS. GOOD SALARY. OLD ESTABLISHED COMPANY.

P-9385, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

ENGINEERS—DESIGNERS

WE PAY THE HIGHEST RATES IN THE INDUSTRY.

In ADDITION TO WAGES OUR EMPLOYEES SHARE ANNUALLY IN COMPANY PROFITS.

WE ARE WORKING 5 DAYS PER WEEK, 9 HOURS PER DAY. THESE POSITIONS PROVIDE PERMANENT, STEADY EMPLOYMENT.

Our continuous expansion and growth is permanent.

We need Engineers and Designers experienced in Blast Furnace, Steel Mill or Oil Refinery Design.

These openings offer excellent future opportunities for men with the following specific experience, training and background:

STRUCTURAL DESIGNERS
CONCRETE DESIGNERS
ELECTRICAL DESIGN DRAFTSMEN
ELECTRICAL DRAFTSMEN
PIPING DESIGNERS
PRESSURE VESSEL DESIGNERS
ENGINEERING DRAFTSMEN
MECHANICAL AND CONVEYOR
ENGINEERING DRAFTSMEN
ELECTRICAL SQUAD SUPERVISOR

Our working conditions are of the best; our offices are well-lighted.

We want men who are qualified and have a genuine desire to develop and advance.

Write and furnish complete details of experience, training, education background, age, salary desired, etc.

ARTHUR G. McKEE & CO.

2300 Chester Ave. Cleveland 1, Ohio

ENGINEERS

ELECTRICAL - MECHANICAL - STRUCTURAL

Openings in Ohio and New York offices offering long term employment with good salary for qualified Group Leaders, Designers and Draftsmen experienced in one or more of the following phases of industrial plant design:

Electrical	Power, lighting layouts and electrical controls.
Mechanical	Plant layout, process piping, conveyors, heating and ventilation, boiler houses, process equipment layout, refrigeration, plumbing, tanks and vessels, packaging equipment, special machinery and equipment.
Structural	Structural steel and reinforced concrete.

Please submit complete resume stating experience, education, salary required and availability date.

THE H. K. FERGUSON COMPANY
Engineers and Builders

The Ferguson Bldg. 1783 E. 11th St. Cleveland 14, Ohio
19 Rector Street New York 6, N. Y.

WANTED

Experienced Structural Design Engineer

for permanent position. College graduate, with approximately four years experience in industrial plant construction, desired. Applicants please state age, education, previous experience and salary desired.

AMERICAN ENKA CORPORATION
Enka, (near Asheville) N. C.

WANTED

MACHINERY DESIGNER

To design textile machinery and other special equipment. Must be thoroughly experienced in design, layout and detail of timing gear trains, cam systems, etc. Prefer graduate Mechanical Engineer. Applicants please state age, education, previous experience and salary desired.

AMERICAN ENKA CORPORATION
Enka, (near Asheville) N. C.

MECHANICAL SUPERINTENDENTS — Thoroughly experienced in process piping and mechanical equipment erection, including a alinless steel pressure and acid vessels, pumps, glass piping, etc.

INSTRUMENTATION SUPERINTENDENT—Experienced in repair and installation of all types of control, indicating and recording instruments.

PURCHASING AND EXPEDITING PERSONNEL—Must have plenty of experience handling requisitions and orders for mechanical equipment, piping, etc., and aggressiveness to trace and expedite and get the materials on the job.

Send outline of experience to Atlanta offices of:

JOHN J. HARTE COMPANY
284 Techwood Drive Atlanta, Georgia

WANTED

STRUCTURAL & MECHANICAL DESIGNERS & DRAFTSMEN

CHICAGO AREA
48 Hour Work Week
Send resume and earliest date available to
John Mohr & Sons
3200 E. 96th St.
Chicago 17, Ill.

ENGINEER ESTIMATOR

For general rigging and millwright work, including machinery and heavy refinery equipment installation.

Contact HENRY W. BIGGE
BIGGE DRAYAGE CO.
2387 Campbell St. Oakland 7, Calif.

GRADUATE STRUCTURAL ENGINEER

with some experience on concrete construction and capable of meeting the public. Promotional work with national organization in large midwestern city. Away from headquarters only one or two nights a week. Car furnished, expense account, good starting salary.

P-9363, Engineering News-Record
520 N. Michigan Ave., Chicago 11, Ill.

CITY OF DETROIT

Engineers experienced in the design and construction of water works needed for $38,000,000 project. Starting salary $4,382, $5,204, $5,736, $6,586 per year with annual increases. Submit resume of experience with application request.

DETROIT CIVIL SERVICE COMMISSION
1501 Water Board Building
735 Randolph Street, Detroit 26, Michigan

First Class SUP'T WANTED

On large flood control State contract in central N. J. Work involves cofferdaming; concrete structures, including chamber water diversions, pipe work and fill. Must have had successful experience on comparable work. State availability; experience, references and salary.

P-9518, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

SALES ENGINEER WANTED:

to represent a well-established Fire Hydrant and Gate Valve manufacturer in the states of N. Y. and N. J. Must be an experienced salesman or have water utility operating experience. Permanent position, salary and bonus.

Interviews arranged on basis of latter stating education, experience, availability, salary desired and other pertinent personal information. If possible, enclose a recent photograph and references. Replies held in confidence.

SW-9399, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

REPLIES (Box No.): Address to office nearest you
NEW YORK: 330 W. 42nd St. (18)
CHICAGO: 520 N. Michigan Ave. (11)
SAN FRANCISCO: 68 Post St. (4)

POSITIONS VACANT

WANTED: STRUCTURAL Engineers for pulp and paper mill design including mill layout and structural steel and reinforced concrete design. In first letter give complete engineering experience, age, education, etc. Address Construction Engineer, P. O. Box 1844, Savannah, Ga.

STRUCTURAL STEEL Detail Draftsmen and Checkers. All types of Structures. Vacation and bonus plan, group insurance, good working conditions. Only top quality men. Send complete written information. Samborn, Steketee and Associates, 1214 Cherry Street, Toledo 2, Ohio.

RESEARCH ENGINEER: Nationally known top-rated manufacturer desires services capable development engineer fully experienced metal panel construction for building walls, floors and roofs. Consideration given only to top flight man capable originating and developing to successful conclusion new ideas and improvements this field. Creative ability essential. Remuneration consistent past performance and future accomplishments. Give full particulars, photo and references. P-9351, Engineering News-Record.

WANTED: PIPING Draftsmen, structural engineers, industrial engineer. Murray Hill 3-7484. (N.Y.)

WANTED EXPERIENCED Sanitary Sewer Foreman. Men with experience in large pipe, deep ditch work, sand, water, wellpoints and general all around sewer savvy for long time job in Pine Bluff, Arkansas. Have approximately 45 miles of sewer works. Don't waste your time or ours. Sober men with good references only need apply. Salary from $90.00 to $140.00 per week straight time. Apply Lancaster & Love, Inc., Pine Bluff, Arkansas.

ESTIMATOR FOR Quantity takeoff and with knowledge of checking details for permanent position with old established building construction company located in Allentown, Pa. Good apartment available if desired. State qualifications and approximate salary desired. H. E. Stoudt & Son, Inc., 1212 S. Fifth Street, Allentown, Pa.

CONSTRUCTION SUPT.—Engineer preferred. Public Job Pennsylvania. State qualifications, previous salary and salary expected. P-9463, Engineering News-Record.

ENGINEERS WANTED, experienced in surveys, design, preparation of plans and supervision of construction of Water Works or Sewage Treatment Plants. State qualifications, salary requirements, references, availability and Military Status. Work principally in Middle Atlantic and New England States. Write P-9471, Engineering News-Record.

WORK WANTED STRUCTURAL DESIGN

Graduate Civil Engineer, Licensed. 20 years experience in design of all types of steel and reinforced concrete buildings and hangars will accept design contracts—location New York City.

PW-9478, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

POSITION VACANT

DRAFTSMEN—STRUCTURAL Steel Detailers experienced only. Alliance Engineering Co., 82 W. Washington St., Chicago. CE-6-2819.

EMPLOYMENT SERVICE

SALARIED PERSONNEL $3,000-$25,000. This confidential service established 1920, is geared to needs of high grade men who seek a change of connection under conditions assuring, if employed, full protection to present position. Send name and address only for details. Personal consultation invited. Jira Thayer Jennings, Dept. L, 241 Orange St., New Haven.

POSITIONS WANTED

ENGINEER CONSTRUCTION C.E. Graduate, 25 years office and field experience design construction all types structures. Estimating, pricing, closing contracts, coordination. Wishes position as contractors' engineer or architects' representative. Some foreign experience. Locate anywhere. PW-9312, Engineering News-Record.

PROJECT MANAGER, general superintendent. Experience includes all details of entire heavy and light building and allied constr. 30 yrs. exp. Salary $12,000 per year. PW-9329, Engineering News-Record.

STRUCTURAL AND Hydraulic engineer 48, design supervision and construction desires interviews during current year with employment view. PW-9409, Engineering News-Record.

MASTER MECHANIC. Equipment Supt., over 25 years experience with erection, repair, maintenance heavy industrial, power house, pumping stations, marine equipment. P. Cornwell, 6824 Colonial Rd., Brooklyn 20, N. Y. TErrace 6-6236.

DIVER-FRANK Hefling, formerly Chicago, San Francisco, US or foreign work. Passport. Capable of deep water, 17 yrs. const., salvage, surveys, special jobs outfitted. Record underwater torch. Improved telephone equipped gear, safety power compressor, single unit fathometer. Experienced designer air lift dredging, dewatering. Miami, Florida, 268 S.W. 8th St., Phone 3-8089.

MAINTENANCE AND Construction of Streets and Sewers. Superintendent with 20 years experience, half of which with Municipal and public works. Streets—Sewers—Equipment—Shop. Have succeeded in reducing Maintenance Costs more than 50 percent. Will be available on permanent or consulting basis June 1st. Reply PW-9460, Engineering News-Record.

COST ENGINEER: Employed—10 years construction experience. Specializing in development of cost information for use in estimating to eliminate guess work. Qualified executive accountant with both professional and private experience. Seeking permanent assignment with unlimited opportunity. Middle aged. Present salary $7200.00. PW-9497, Engineering News-Record.

CONSTRUCTION EXECUTIVE. Administrative Architect, Project Manager and Contact Man. 23 years experience in architecture, engineering, general contracting, and property management. Graduate Architect-Engineer. Registered. PW-9455, Engineering News-Record.

ESTIMATOR-BLDG. CONSTRUCTION. Take off, pricing on all types of jobs. Project Management, Buying, Contracts. Experienced, energetic. PW-9482, Engineering News-Record.

BUSINESS OPPORTUNITY

Contractors:
I am interested in financial and active participation in a small construction company. My background: construction, engineering, degree Mass. Inst. of Technology, and business. Reply BO-9489, Engineering News-Record.

SPECIAL SERVICE

Right of Way,
Clearing Wanted. By Contract. Will furnish men and equipment. Joe Ralick, Box 186, James City, Pa.

PATENT ATTORNEY

Patent Practice
before U. S. Patent Office • Validity and infringement investigations and opinions. Booklet and form "Evidence of Conception" forwarded upon request. Lancaster, Allwine & Rommell, Registered Patent Attorneys, Suite 454, 815-15th Street, N. W., Washington 5, D. C.

FOR RENTAL or SALE

Archer Single and Double Heavy-Duty Tubular Towers with Concrete Tower Buckets and Hoppers, if required.

DRAVO-DOYLE COMPANY
2601 Preble Avenue Pittsburgh 33, Pa.

SIDEWALK FORMS

2000 feet of Steel Sidewalk Forms with 4 inch dividers. Good Condition. Cheap. Call after 5 o'clock.

MARTIN MORAN
221 E. 42 St. Brooklyn, N. Y.
BUckminister 7-2274

FOR SALE

111-M Marion Shovel
Euclid Rear Dump Trucks

FS-9305, Engineering News-Record
330 W. 42 St., New York 18, N. Y.

FOR SALE

TD-18 Tractor with Bucyrus-Erie hydraulic blade, new 1949 condition excellent.
TD-9 Tractor with Bucyrus-Erie hydraulic blade, new 1948 condition excellent.
Bay City 30 chain crowd shovel, condition excellent.
CHE Triton roller as good as new.

WANTED

45 foot Boom with 1—20 ft. or 2—10 ft. inserts for Lima Model 34 Paymaster.

HAROLD MacQUINN
Bar Harbor, Maine Phone 769

WANT TO BUY

6—50,000 & 2—100,000 GAL CAP ELEVATED TANKS ON TOWERS

9—10,000 TO 25,000 GAL CAP STEEL STORAGE TANKS

DARIEN 60 E. 42nd N. Y. 17, N. Y.

WANTED

25 Ton
DIESEL LOCOMOTIVE CRANE
1712 Seventh Ave. North
Birmingham, Alabama

WANTED

Standard Size Ram for 9B2 McKiernan Terry Pile Hammer. Must be in First Class Condition.

L. A. DAVIDSON
213 E. St. Joseph St., Lansing 15, Michigan
Phone 2-2666

WANTED

A used one cubic yard dragline bucket in good condition.

Reply to:
The Grasso Construction Company
P. O. Box 6086
Bridgeport, Connecticut

WANTED

2 to 10 ton cab overhead crane AC 3 motor preferred 42' - 6" span.

VICTOR OOLITIC STONE CO.
P. O. Box 65 Bloomington, Ind.

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FOR FORTY YEARS our courses have helped thousands to better positions and to pass State Board Examinations.

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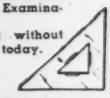

WILSON ENGINEERING CORP.
College House Offices - Dept. E.
Harvard Sq. Cambridge, Mass.

ESTIMATING SERVICE

Any Trade and Type of Project
Literature and Sample on request
Construction Survey Cooperative
101 Park Ave., New York 17, N. Y.
MUrray Hill 5-7317 Founded 1922

FOR SALE:

1—International TD-9-400-1, Extended Oscillating track, Equipment Combination for use with Bucyrus-Erie—9DSG—H Dozer Shovel, 60" gauge Extended track frame—15" Shoes Equipped with 1 cu. yd. Heavy duty Bucket, 7 digging teeth, Bulledizer blade—7'3" width Interchangeable, Bucket & Bulledozer are Hydraulic Controlled. This machine new Sept. 1950—has worked about 100 hrs—price $10,400.00 F.O.B. Utica.

1—Ustrac Bulldozer, new, never used. 4 cylinder Continental Red Seal Industrial gas engine 20 drawbar h.p. & 25 belt h.p. Equipped with bulldozer blade—5' wide for quick sale.
Price $2600.00 F.O.B.

1—Trench Machine #105 Austin trench machine dig 28" width—10' depth. In working condition.
Price $2800.00

JOSEPH J. CERRI
1313 Leeds St. Utica 3, N. Y.
Telephone 2-8429

WANTED

Hoist Drum lagging # B25417 for Lorain 820, Serial No. 17019
and also
Fairleads for the above machine
Call or Write

VILLA CONTRACTING CO.
233 North Avenue, Westfield, N. J.
Phone: Westfield 2-4100

WANTED TO BUY

42-B Erie Steam Crane
with 90 ft. Boom

McLAIN CONSTRUCTION CORP.
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5 to 10 yard Walker type dragline Bucyrus Erie, Page or Marion. Write serial number, age, condition and price f.o.b. cars and location for inspection. Detailed description first letter.

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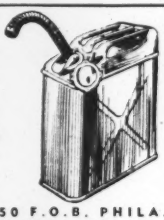

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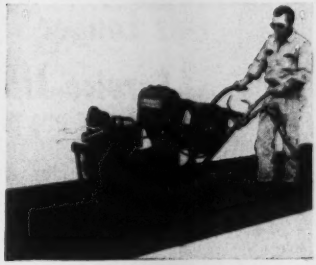
Six coal-tar-base anti-corrosive coatings are specially compounded for protection of metals, wood, masonry, and insulation. Steelsaver is a high-gloss coating for application where ordinary corrosive conditions are present. It can be dipped, sprayed, or brushed. Yankee Clipper is specially designed for protection of marine equipment. Rockcoat provides protection from abrasives and non-skid surface for overhead walkways, decks, and ladders. Cermastic B-29 combats extreme corrosive conditions. It has the consistency of soft butter, can be applied by spray or brush, and dries to a high gloss. Concoat 75 resists extreme vibrations, contractions, and expansions. Concoat aluminum is an anti-corrosive protective coating that provides a decorative aluminum finish.—CONTINENTAL COATINGS CORP., 304 W. 44TH ST., NEW YORK 19, N. Y.



Self-propelled saw

Saw for cutting concrete and asphalt is powered by a 13.3-hp gasoline engine. Cutting depth is determined by size of blade used. The self-propulsion feature is said to increase life of cutting blade and to speed sawing operations. Dash panel contains water-pressure gage, spindle-speed tachometer, motor throttle, cut-off switch, and transmission control lever. Lever-lock control enables operator to remove blade from cut, and then lower it to the same depth without changing adjusting screw.—CONCRETE SAWING EQUIPMENT INC., 15 N. OAKLAND ST., PASADENA 1, CALIF.

Self-heating asphalt iron

Surfa-Slick smoothing iron provides sufficient heat to heat asphalt; to heat tamp; and to clean tools. Fea-

(Continued on page 101)

Here's a Wire Rope That LASTS

J&L STEEL

Operators Get Longer Service Life with . . .

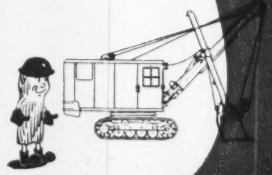
J&L CenterFit WIRE ROPE

If you're responsible for the wire rope on clamshells, shovels or any other earthmoving equipment that operates on small diameter sheaves and drums, J&L CenterFit Wire Rope can help you save money.

CenterFit, produced exclusively by Jones & Laughlin Steel Corporation, has a unique design engineered to give you more steel and fewer voids than conventional wire rope. All strands run in the same direction with outside strands fitting snugly into the valleys between inside strands. The result—greater strength . . . easier handling . . . which means longer service life.

In addition J&L CenterFit is lubricated with BRONZ-LUBE, the exclusive J&L lubricant with high film strength that prevents squeezing out between the strands. BRONZ-LUBE contains fine flakes of soft bearing metal that provide a smooth wear-resistant surface for every wire—forms a close adherent coating that doesn't drip off unless subjected to extremely high temperatures.

Users' records prove that J&L CenterFit lubricated with BRONZ-LUBE reduces operating costs, diminishes downtime and increases profits when used in the applications for which it was designed.



AND HERE'S HOW YOU CAN FIND OUT MORE ABOUT CENTERFIT WIRE ROPE!

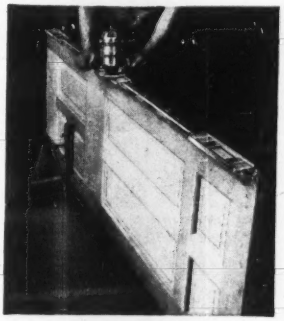
Just write to Jones & Laughlin Steel Corporation, 428 Jones & Laughlin Building, Pittsburgh 30, Pa., and ask for a free copy of our booklet, "CenterFit." It gives you detailed information on the construction and applications of this exclusive J&L wire rope and tells how others are saving money through its use.

JONES & LAUGHLIN STEEL CORPORATION

From its own raw materials, J&L manufactures a full line of carbon steel products, as well as certain products in OTISCOLOY *and* JALLOY *(hi-tensile steels).*

PRINCIPAL PRODUCTS: HOT ROLLED AND COLD FINISHED BARS AND SHAPES • STRUCTURAL SHAPES • HOT AND COLD ROLLED STRIP AND SHEETS • TUBULAR, WIRE AND TIN MILL PRODUCTS • "PRECISIONBILT" WIRE ROPE • COAL CHEMICALS

tures includes: Light weight of 40 lb; operates on gasoline as a fuel; shoes are replaceable; has sharp edges for cutting asphalt joints; and has a knurled handle for angle leverage. It heats up in 10 min.—J. E. Woods Mfg. Co., 1516 First St., San Fernando, Calif.



Door and jamb templet

Two new door and jamb butt templets are designed for use with the Stanley HB8 hinge butt-router. The T5 is a complete adjustable templet for cutting two or three hinge mortises on a door and jamb. The T6 is a complete adjustable templet for cutting two hinge mortises on a door and jamb. Both will handle door thicknesses from 1⅜ to 2 in. Design of the templets permits moving from door to jamb without reversing ends or turning the unit over. —Stanley Electric Tools, Div. Stanley Works, New Britain, Conn.

High-vacuum hand pumps

Pump in three new models can be installed in 1¼ and 2-in. bungs of drums and tanks. It can be used for dispensing oils, water, turpentine, and other similar liquids. The 970 has a non-drip discharge spout, and a baffle or dam in the spout to permit expansion, while preventing leakage.

(Continued on page 104)

CONTROL POWER BETTER

8 out of 9
Major Farm Tractor Manufacturers Use
ROCKFORD CLUTCHES
To Help Make Their Tractors Operate Reliably and Efficiently in the Most Rugged Service
Let our engineers show you how ROCKFORD CLUTCHES will help make your product stand up under the stress of heavy duty work.
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ROCKFORD CLUTCH DIVISION
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313 Catherine Street, Rockford, Illinois

ROCKFORD CLUTCHES

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Engineers—Fabricators
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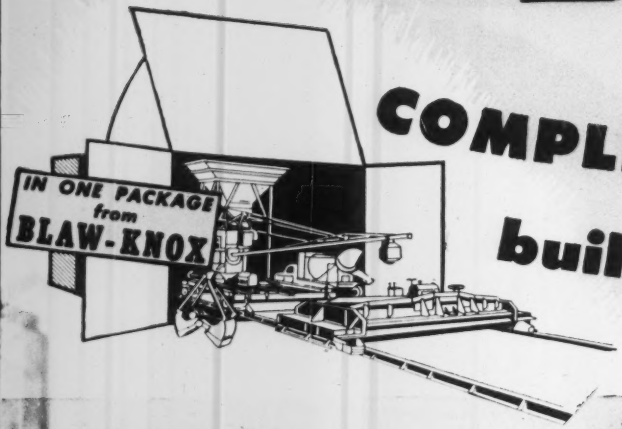
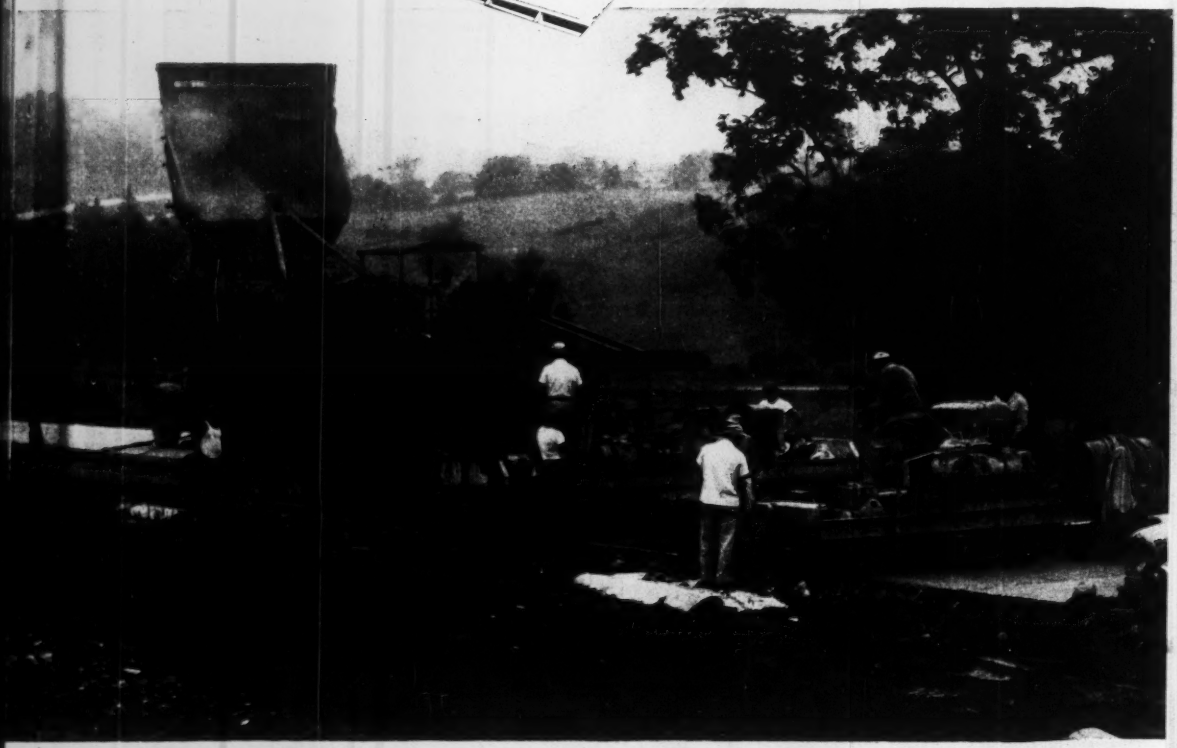
● DIPPER ●
CLAMSHELL
Bolted sectional steel hulls for landlocked, inland waters
If you need a dredge, write us!
AMERICAN STEEL DREDGE CO. INC.
FORT WAYNE 1 · INDIANA · U.S.A.
DESIGNERS AND BUILDERS OF DREDGING EQUIPMENT SINCE 1905

The BLAW-



COMPLETE PACKAGE builds the world's



Here's the "Complete Package" of Blaw-Knox concrete paving equipment working on the 24' dual lane paving of the Taconic Parkway near Poughkeepsie, New York. The scene above shows the MultiFoote Dual Drum 34E Paver, Blaw-Knox Road Forms, Paving Spreader and Finishing Machine. The "Complete Package" also includes Blaw-Knox Clamshell Buckets, Aggregate Batching Plants, Bulk Cement Plants and Precision Subgraders.

KNOX

of concrete paving equipment

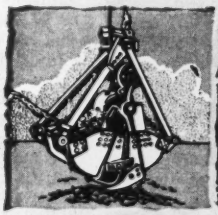
superhighways and airports

ALL over the world, contractors working the big contracts like the Taconic Parkway, Edens Superhighway, Pennsylvania Turnpike, or airports in Puerto Rico, Lebanon, France, Bangkok, Indo-China and many others, are utilizing the advantages of the *one-source* "Complete Package" of concrete paving equipment. More and more contractors are realizing the greater profit that comes with 100% mechanization of the job, from material handling to the finished slab.

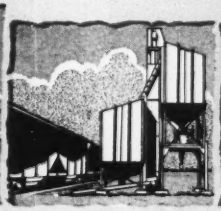
Here's how the Blaw-Knox "Complete Package" simplifies your problems. You get every single piece of equipment you need for any concrete construction job, from forms to paver to finisher, and each piece of equipment is matched to the others to give you a balanced team for the high-output assembly-line production that keeps you consistently ahead of schedule.

In addition, you have all the benefits of *one source* of supply . . . you get all your equipment on *one order*, in *one shipment*, with *one financial arrangement* covering the whole deal. The field performance of each piece of equipment is backed by *one undivided responsibility*. *One* dependable distributor organization provides a ready, experienced source for service and parts.

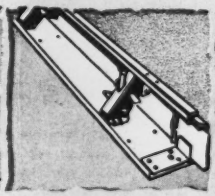
When so many big-time contractors are profiting with the Blaw-Knox "Complete Package", why don't you put these bidding advantages at *your* service on your next job? Your Blaw-Knox—Foote distributor will gladly give you the whole story.



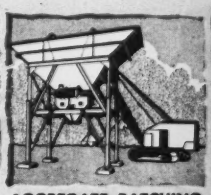
CLAMSHELL BUCKETS



BULK CEMENT PLANTS



ROAD FORMS



AGGREGATE BATCHING PLANTS

CURB AND GUTTER FORMS

BLAW-KNOX ★ FOOTE CO.

BLAW-KNOX DIVISION OF Blaw-Knox Company,
Farmers Bank Building,
Pittsburgh 22, Pa.

The Foote Co., Inc.
Subsidiary of Blaw-Knox Co.,
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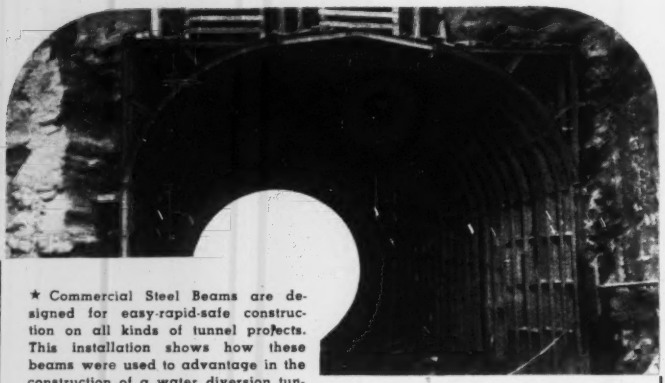


★ Commercial Steel Beams are designed for easy-rapid-safe construction on all kinds of tunnel projects. This installation shows how these beams were used to advantage in the construction of a water diversion tunnel. Note the large working area—simplicity of installation—and safety afforded workmen during and after installation. These are features which make for rapid construction and low costs. Commercial easy-to-install supports are available in every size and radii for every job.

Contact a COMMERCIAL Engineer for suggestions on the adaptability and cost of installation on your next tunnel job.

Make the job safe do it faster and at lower cost—with

COMMERCIAL STEEL BEAMS

THE COMMERCIAL SHEARING & STAMPING CO.
YOUNGSTOWN 1, OHIO

CUTS COSTS
•
SAVES LABOR
•
INSURES A BETTER JOB
•
FOR SALE OR RENT AT JACKSON DISTRIBUTORS

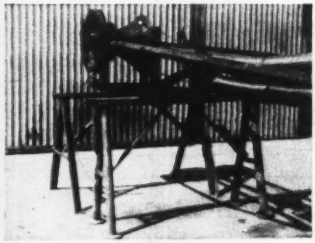
Eliminates manual vibrating of concrete at side forms. Saves the better part of two men's labor. Mounts on any modern finisher, Jackson Vibratory Paving Tube or Spreader. Employs two or more vibratory units that are simultaneously lowered into or raised from the concrete by the finisher operator. Units operate close to forms or reinforcement without fouling — ride over any obstruction encountered. Will not penetrate into sub-base. Assures thorough compaction regardless of speed of finisher or spreader — no spots missed. Long-wearing, trouble-free.

MANUFACTURED BY ELECTRIC TAMPER & EQUIPMENT CO. FOR
JACKSON VIBRATORS, Inc., LUDINGTON, MICHIGAN

The 971 has an 8-ft static wire hose and UL-recommended vacuum breaker. The 972 is equipped the same as the 971, but has an 8-gal flow meter.—TOKHEIM OIL TANK & PUMP CO., FORT WAYNE, IND.

Fork-lift truck

Shorter length, shorter width, and narrower turning radius are features of this 2,000-lb-capacity fork-lift truck. The FB20 is available with a 24-in. or 15-in. load center. The 9¼-in.-dia clutch is easily replaceable in 30 min without removing transmission. The FB20's are available with standard masts having lifts of 72, 84, 108, 114, and 120 in.—THE BUDA CO., HARVEY, ILL.



Automatic tagline

Calomatic taglines, available in five sizes, are designed to provide an automatic and constant tension with a maximum variation of 20%. They are made for assembly inside the boom in such a way that nothing projects out except the tagline cable. Tagline reel is energized by a spring attached at both ends to a cone drum. This drum is grooved to fit the cable. The Model A-P (smallest) is designed for ¾-yd clamshells, and affords a 75-ft pull over a 40-ft range. Larger models have the same design, and are built in a range to handle unit with buckets to 2½-yd capacities. The Model E is a compression-type unit and is available with 20 or 30-in. reels.—CALOMATIC EQUIPMENT CORP., 4546 E. WASHINGTON BLVD., LOS ANGELES 22, CALIF.

The Surveyor's Notebook

Reporting on Unusual Surveying Problems and Their Solutions

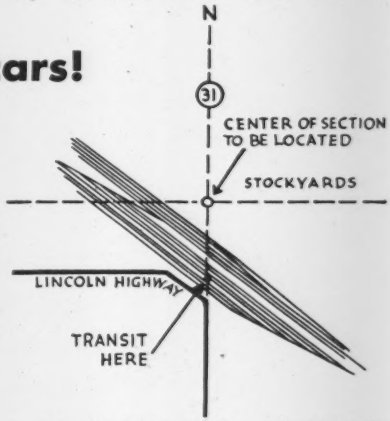
Notekeeper: W. & L.E. Gurley, America's Oldest Engineering Instrument Maker

Boxed in by Boxcars!

"Having spent half a century behind the transit, or directing its use, I've solved every type of field problem," recalls the Deputy Surveyor of Douglas County, Nebraska. "But while locating alignment for the Lincoln Highway through the town of Valley, Nebraska, I hit a situation that almost had me stumped."

"My objective was to set a point at the intersection of the center line of Section 31 and the center line of a northwesterly street, immediately adjacent to the Union Pacific's main-line right of way. This depended on the true location of the quarter-section line, which was completely blocked by boxcars, gondolas, flats and whatnot packed solid on 10 yard tracks of the right of way. On top of that, stockyards straddled the quarter line.

"Looking north along the center of the highway, I noted an extra-high boxcar, about on line, on an inner track. I climbed to the top, and found the answer to my problem. The terrain was flat as a floor, so with a tall marker



(two bamboo fishing poles, spliced) at the north corner, and a picket at the south, it was a cinch to see through the mile.

"Checking with the stationmaster to make sure there would be no switching, I borrowed a rope; hoisted my Gurley Transit to the top; and soon balanced in on line. Two trains passed and shook the instrument; but that was soon corrected. I double centered to be sure that the shift of my body had no effect.

"Reference points for checking center of the section—if found—and the intersection point of the right of way were set. The Gurley had done its job, for a few minutes with a spade revealed a three-inch pipe—the corner to which we had no ties."

SURVEYORS: Send in an unusual field experience for this series. We also welcome your comments and suggestions.

Gurley for City and County Surveying

"That day we added a boxcar to our list of useful surveying tools—a list always headed by a Gurley Transit."

Surveying both city and county jobs from his Omaha office, this surveyor requires a versatile instrument. He has just added another Gurley Transit; keeps one in his car at all times for incidental work.

Whatever type of surveying *you* do, you'll find there's a Gurley Transit especially designed for the job. Bulletin 50 gives all details.

W. & L. E. GURLEY, UNION PLAZA, TROY, N. Y.

Surveying and Engineering Instruments, Hydraulic Engineering Instruments, Standard Precision Weights and Measures, Paper and Textile Testing Instruments, Reticle Making Facilities, Aeronautical Navigating Instruments, Meteorological Instruments.

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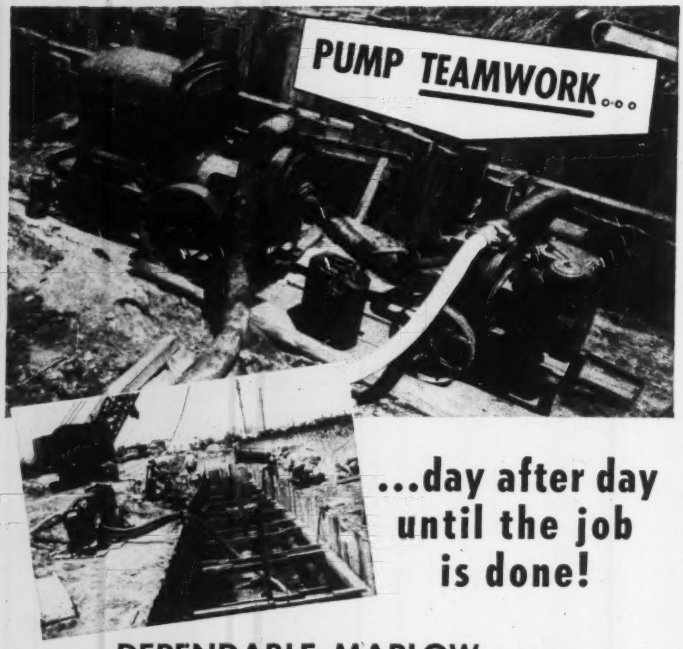
Surveying and Scientific Instrument Makers
Since 1845



...day after day until the job is done!

DEPENDABLE MARLOW Self-Priming Centrifugal Pumps team up to keep the ditch dry on this pipe laying job through Canarsie, Brooklyn, N. Y.

It takes a good pump to stand up to continuous pumping day in and day out. These pictures show TWO good pumps . . . BOTH Marlow Water Wizards . . . at work to keep this big job going smoothly. Trouble has no place here. A contractor wants dependability . . . the kind that keeps men and other equipment on the job and saves him money. That's the famous Marlow dependability.

Marlow makes the world's most complete line of construction pumps — and the largest size range. Self-Priming Centrifugals and Mud Hog Diaphragm Pumps. Write for Bulletin C48.

MARLOW PUMPS 510 GREENWOOD AVE. RIDGEWOOD, N. J.

MARLOW PUMPS — OFTEN CHALLENGED BUT NEVER SURPASSED.

Since 1922

GUNITE Shoot with air

for CONSTRUCTION and MAINTENANCE

Experience That Counts

Write today for complete details of our services

INDIANA GUNITE & Construction Co., Inc.

226 NORTH ALABAMA STREET

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DRILLING CONTRACTORS

DIAMOND AND SHOT CORE BORINGS—DRY SAMPLE BORINGS

Foundation Testing for Bridges, Dams and All Heavy Structures

Also

Manufacturers of Diamond and Shot Core Drills, Accessories and Equipment

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MANUFACTURERS' PUBLICATIONS

Armco catalogs—Three new catalogs are now available from Armco. Manual RW-8470 describes bin-type retaining walls for embankment stabilization. It features illustrated case histories of typical installations. The second bulletin, entitled "Subgrades Shouldn't Drink", deals with the use of drainage structures in highway construction. The third bulletin is entitled "Why Hire a Wrecking Crew to Install Underground Structures", and deals with the installation of sewers and other underground structures without tearing up pavements.—ARMCO DRAINAGE & METAL PRODUCTS, INC., MIDDLETOWN, OHIO.

Portable compressor—Large-size rotary-type compressor is described in detail in Bulletin 2310. It features a description of how high capacity (600 actual cfm free air at 100 psi) is obtained while keeping weight to a minimum (9,500 lb). The bulletin describes the construction of the Mobil-Air 600 Gyro-Flow; contains photographs of typical applications; lists principal advantages said to accrue through its use; and describes other I-R features.—INGERSOLL-RAND CO., 11 BROADWAY, NEW YORK 4, N. Y.

Wrecking tool—Folder (4 pp) describes the Ripper Jack—a wrecking tool for dismantling wood structures with minimum damage to the lumber. The tool, a combination crowbar, pry rod, nail puller, and sledge, is described in detail. Illustrations show the various positions in which the tool can be used, and text describes its principal features of construction and operation.—CALUMET STEEL CASTINGS CORP., 1636 SUMMER ST., HAMMOND, IND.

Spark plugs—Complete line of automatic spark plugs is described in this catalog. It describes principal features claimed for the BG plugs; tells how to install them properly; and describes how to keep them operating efficiently. Replacement data and proper gap settings are listed for all major equipment.—THE BG CORP., 136 W. 52ND ST., NEW YORK 19, N. Y.

Bituminous distributor—Two catalogs by Bros describe the Bituminizer for distributing and spraying bituminous materials and the new

Spraymatic bar. Features listed in the Bituminizer catalog include: V-bottom rectangular tank, diamond-shaped flue, gear-type pump, material-handling system, side-mounted power unit, and one-man cab control. All specifications are listed in detail. The Spraymatic catalog features a description of how this bar is designed to save material and time and to provide high-quality bituminous roads. Sketches and text are used to explain its principal features of operation and construction.—WM. BROS BOILER & MFG. CO., 1057 TENTH AVE., S. E. MINNEAPOLIS 1, MINN.

Zeolite softeners—Bulletin 4520 describes sodium zeolite water softeners equipped with a Hydromatic single-control valve. The bulletin gives a detailed explanation of the sodium-zeolite softening process containing a definition of terms, data necessary for laying out a softening plant, factors governing sizing of equipment, selection of zeolite materials, and a description of the four steps of operation of a zeolite softener.—COCHRANE CORP., 17TH ST., & ALLEGHENY AVE., PHILADELPHIA 32, PA.

Wall-tile installation—Handy hints on installing wall tile are contained in Bulletin P7. It tells how to obtain maximum coverage from the cement; how to use plastic extruded outside corner pieces; and how to make straight or diagonal cuts of plastic tile. Also included are tips for fast and easy clean-up.—HACHMEISTER-INC., 2332 FORBES ST., PITTSBURGH 13, PA.

Concrete mixer—Bulletin illustrates and describes recent improvements on the 16-S Dandie 3-bag mixer. Features of the mixer include all-welded heavy-duty frame construction, coil-spring mounting to balance the mixer, and cast-steel drum heads with machined roller plates. Schematic drawings listing detailed dimensions are included, as are specifications for the extension track and tower loader attachments. — KWIK-MIX KOEHRING CO. SUBS., PORT WASHINGTON, WIS.

Rotary masonry drills—Features and advantages of the Termite concrete drills are listed and described in this small-size folder. Featured is a description of the specially designed Wictu inserts for penetrating concrete at high speeds. The folder lists all sizes in which the Termites are available. Also described are the core Termites for drilling larger holes.—TERMITE DRILLS, INC., 2081 FOOTHILL BLVD., PASADENA 8, CALIF.

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The UNEXPLOITED

Somewhere away from the big deals, somewhere along the industrial frontiers of America, the little people, the little towns, the industrially "little" states are seeking new ways and means to bring factories into their localities.

When you stack their efforts against ENGINEERING NEWS-RECORD's most recent industrial building backlog figure of $6,849,529,000 (which represents most of the industrial construction of more than $250,000 definitely planned for the year ahead), when you stack their dollar figures against industry's reported $13,000,000,000 expansion plans (ENR April 12, p. 19) you can see how marginal such efforts are.

But in terms of community betterment, and in terms of industry dispersion and a more balanced economy, the significance of the efforts of many small municipalities throughout the nation cannot be discounted.

Just one example: The Greater Muskegon Industrial Foundation.

• **Small money big results**—Muskegon Foundation policy is strictly limited to the loan of money for construction purposes—"brick and mortar"—so that should a business fail, the loan money is in a rentable factory building, not a lot of useless, or hard-to-dispose-of equipment. Organized in 1925 with a subscribed capital of $300,000 and headquarters in Muskegon, Mich., the foundation over a twenty-year period made 22 loans to 22 industries. All the loans have been recovered.

During this period the city's population doubled to 105,000, factory employment tripled to 30,000 and factory payrolls increased six times to $112,000,000. More than the initial $300,000 contributed to the growth experienced (other money—regional developments)—but the foundation proudly points to the fact that 70% of the employment increase took place in factories aided through its funds.

The state of Michigan has many such funds privately subscribed. Among its enterprising communities are Sturgis, Escanaba, Ludington, and Traverse City—all out to bring in new industrial plant through schemes of subsidy or rental.

Some of New England's more rural states are taking similar steps to balance their economies. Maine, New Hampshire and Vermont all have development corporations.

• **Old centers, other problems**—New England community effort on behalf of new plant has been somewhat limited. This is because New England, in contrast to the South or West is an old industrial area.

In Vermont ten cities have plans: Lyndonville, St. Johnsbury, Springfield, Bellows Falls, Brattleboro, Bennington, Rutland, Brandon, St. Albans and Swanton. These would all raise money for new plant.

In West Virginia Community efforts on the part of the cities of Point Pleasant, Spencer, Ravenswood, Beckley, New Martinsville, Huntington, Elkins, Thomas, Williamson, Oak Hill, Mount Hope, Richwood, Grafton, Clarksburg and Martinsburg will provide from $50,000 to $150,000 for new factories for qualified companies.

In Indiana the cities of Gary, Evansville, Jeffersonville, Lebanon, South Bend, Shelbyville and Marion all have funds available for factory construction, or are planning steps in that direction.

In Pennsylvania the Reading Chamber of Commerce is building a factory with 100,000 sq. ft. of floor space for the Brown Trailers Mfg; the Renovo Trade Assn. is building a factory with 33,000 sq ft of floor space for Renova Shirt Co; the Wyoming Valley Industrial Development Fund has $260,000 available, its goal being $350,000; the Altoona Enterprises, Inc. has a goal of $1,000,000 to build up business in Altoona and environs, and in the Scranton area the Lackawanna Industrial Fund Enterprises has $10,000,000 as a goal for money invested in new enterprises (ENR Nov. 9, p. 120).

In Florida the state Improvement Commission has a planning and development division to help locate money or credit from various insurance companies.

The commission has been at this only a year, but hopes to move in some $46,000,000 of new industrial plant through helping industrial companies in their planning.

In Texas, where private money is building a great boom, the town of Tyler has commanded attention with its Industrial Foundation, now capitalized at $300,000. A private, non-profit organization, it follows the usual pattern, building plant housing, and renting it to bring in a 6% annual return on total amount invested plus insurance, taxes and maintenance costs. Rentals are made with an option to buy.

In Kentucky, a state law allows municipalities to issue revenue bonds in support of municipally built, modern factory plants which can be leased to private companies. Some twenty cities are planning issues of this type (ENR Nov. 2, p. 27).

In contrast with these smaller undertakings is the bigly pushed, large-dollar industrial expansion project of Puerto Rico (ENR Feb. 15, p. 32). There—with much rum money—the Puerto Rico Economic Development Administration and its sister agency the Industrial Development Company not only provide loans, but engineering and management help to interested businesses that wish to take advantage of its tax-free locale.

• **Big stakes, small resources**—If anything, these small undertakings with their small dollar volume indicate not only the braveness of the local business people who fight the up-hill battle against large industrial centers, but also the regional and sometimes even the technical inadequacy of such efforts.

Contrast the small loan arrangement with the streamlined procedure that ante's up the money, designs, builds, engineers and finally provides laborers for the new management of the newly arriving firm. In the former the management must of necessity do much thinking. In the latter it picks up the key and walks in.

Here is a new area to instigate building activity where municipal or private action is not enough.

Pride in up-to-date, modern factories and the good working conditions of their citizens—interest in increasing the income of their people and the wealth of their communities may yet provide the incentive, in the future, for the issuance of $30 to $60 million revenue bond issues for new industrial facilities, much as today these issues back roads and new highways.

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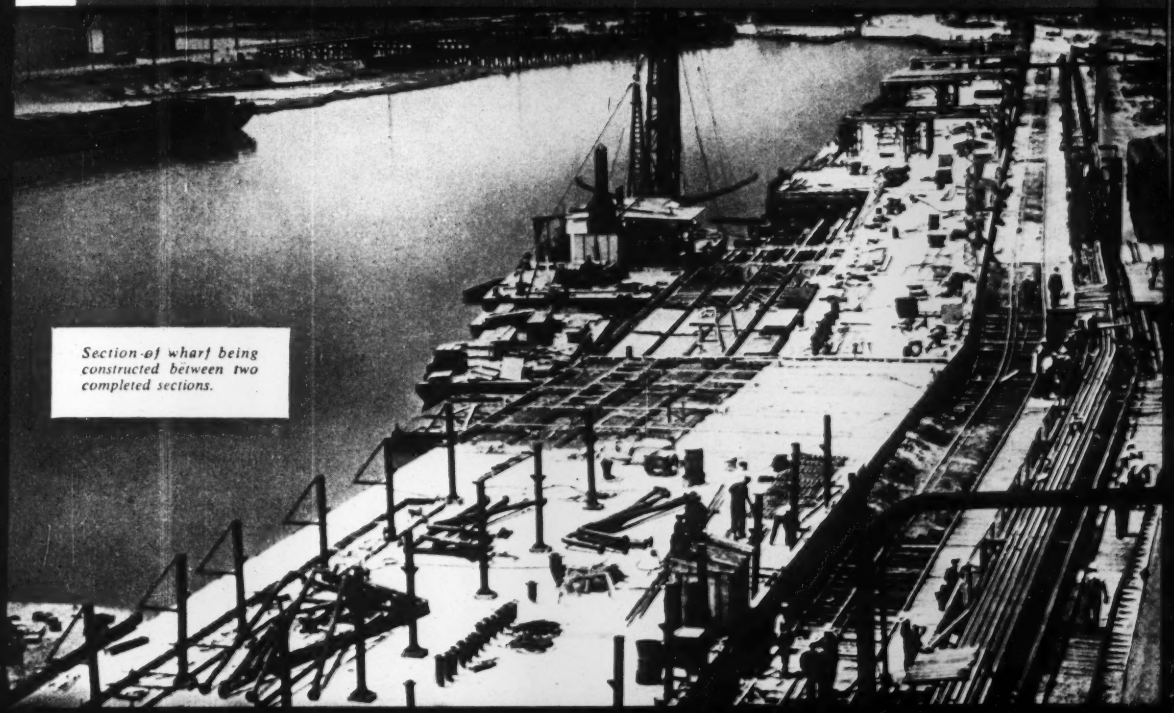

Section of wharf being constructed between two completed sections.

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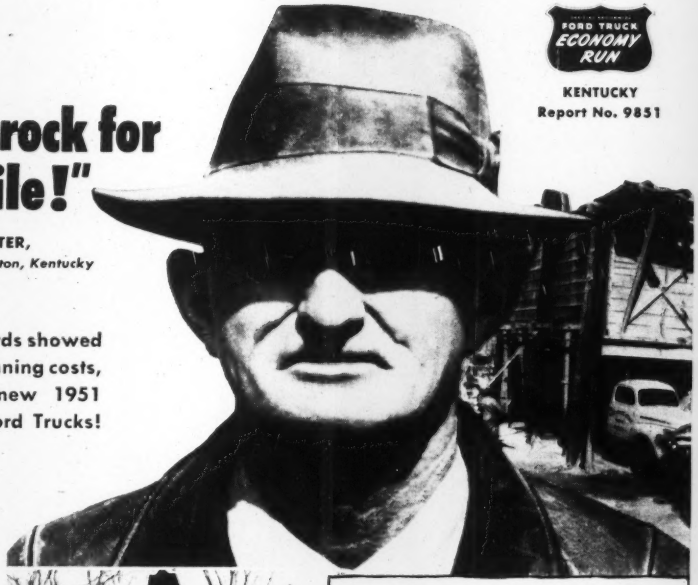

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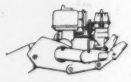

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